DOWN IN THE DUMPS

CONTEXT STATEMENT AND GUIDANCE ON HISTORICAL-PERIOD WASTE MANAGEMENT AND REFUSE DEPOSITS

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NON-DISCRIMINATION

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Background and Purpose

Discarded organic and inorganic waste products provide archaeologists with one of the major sources of information used to address questions about past human behavior. Unlike prehistoric sites, mass-produced manufactured goods make up a large percentage of the items found at historical-period sites. The industrial revolution and mass production resulted in an increasing availability of inexpensive, disposable products. This combined with ever-expanding transportation networks and increasing population has lead to the proliferation of solid waste.

For historical archaeologists, the proliferation of refuse in the 1800 and 1900s is both a major source of information and a major source of difficulties in determining the National Register eligibility of historical-period trash deposits. Refuse disposal sites range in size from large landfills to small trash scatters. They may be found in isolation or as components of larger sites/properties or districts. Seemingly isolated historical-period trash deposits are particularly problematic. The State Historic Preservation Office Advisory Committee on Historical Archaeology and the State Historic Preservation Office (SHPO) identified a need for guidance on National Register eligibility and documentation for "isolated historical-period refuse deposits."

As the committee and the SHPO began working on this guidance, it became apparent that any discussion of "isolated historical-period refuse deposits" needed to take place within the larger framework of "waste management systems." The purpose of this document is to provide guidance for agency officials and consultants on the identification, evaluation, and documentation of historical-period properties associated with solid waste management. The history of solid waste (garbage and rubbish) and liquid waste (cesspools, sewage, etc.) is closely related, but this document will focus on solid waste management systems. While the temporal parameters of the historical overview include the Spanish Colonial period to the 1960s, the primary focus of the eligibility discussion is on properties dating from the mid 1800s to the mid-1900s. A more restricted temporal focus for the eligibility discussion is justified, because researchers have experienced difficulties determining the eligibility of properties in this time period and because of the relatively large number of historical-period trash disposal properties dating to this period.

Organization

The organization of this document includes an overview on the history and nature of trash disposal behavior, a discussion of the property types associated with waste management, National Register-eligibility guidance for property types, site identification and recordation of waste piles and open community dumps, and a bibliography. Waste management definitions and additional reference materials are listed in Appendix A. Appendix B contains examples of trash-related ordinances and time lines for a number of Arizona communities. These tables provide some patterns and time markers but do not represent exhaustive information on each community. In researching refuse disposal practices, it became apparent that communities and historians were not particularly interested in writing about "garbage." Most of the information in these tables was compiled using Council Meeting Records and Ordinance books from larger communities that were available at the Arizona State Library, Archives, and Public Records; from the Cities of Flagstaff, Florence and Phoenix; and data from a number of archaeological reports. We are grateful for the efforts of the Town of Florence staff who compiled and sent information on their community's ordinances. Pat Stein also assisted by providing newspaper information from Payson and neighboring communities.

This document is intended to be a working document. It will be updated as additional information is obtained. The Advisory Committee on Historical Archaeology and the SHPO hope that this document will be useful to archaeologists and welcome feedback on the contents of the document and additional information. If you have any comments or additions, please direct them to Carol Griffith at Arizona State Park/SHPO, 1300 W. Washington, Phoenix, AZ 85007.

THE WASTE MANAGEMENT SYSTEM

Introduction

One of the least-recognized facts about material culture is that sooner or later it outlives its usefulness and is discarded. Because it does not just disappear, this waste must be removed from areas of daily activity or it will pile up and become a health and safety hazard. Waste management systems involve the storage, transfer, treatment, and disposal of items that are deemed to be no longer useful.

Organized waste management is a process of accumulation. Items that are used individually are discarded into a series of increasingly cumulative transfer, or "bulking" points. This is where they are stored before being removed to a final depository. At each transfer point, waste from more locations is combined. The result is that at successive bulking points the deposits become larger and more generalized as individual contributions are mixed. Dumps and landfills are the endpoints of the system and are the largest, most generalized of the deposits.

Storage and Transfer

Any waste management system begins with someone using something and then throwing it out. Garbage from food preparation and other kitchen-related activities are bulked together in waste receptacles located at or near the point of use. Production rubbish in a manufacturing venue ends up stored in a 50-gallon drum near the work area. These storage locations are known as transfer points. The deposits removed to transfer points reside there for a very short time. In most cases as soon as the receptacle is filled, the waste is removed. It is unusual, but possible, for the material in the initial transfer point to be directly placed into a final depository. It is more common for the material to be taken to a secondary transfer point.

At secondary transfer points waste is mixed with waste from other generators and/or with waste from earlier episodes of transfer for the same generator. As with the initial transfer facility, any particular set of waste does not spend a long time at these secondary transfer facilities. As the amount of waste reaches the capacity of the facility, or as the management schedule of the facility dictates, the material will be removed to the next-higher-order transfer station or to the final-disposition point. The number of transfer points an item will pass through on its way to the final-disposition point varies. A household-based waste management system may not have need for more than one or two transfer points, while a large urban system would be more complicated.

Transfer sites may be on the lower end of the organized waste management system, but they rate very high in archaeological information potential. Being related to a single or small set of activities resulting from the actions of an equally small set of generators (i.e., the individuals, households, etc. generating the waste) they present the best opportunity to examine fine-scale behaviors.

The drawback is that it is unusual for an individual item to spend a great time at any one point in the system. The intent is to move items down the line. The archaeologist is dependent on the fact that seldom is the removal process perfect. Some items get left behind and the transfer point becomes their site of final disposition. Over time, these "escaped" items can develop into a midden that marks the site of the transfer point. Only very small items will be left behind. Larger items will be noticed and returned to the container. The resulting deposit will consist of very small objects and small fragments of larger items.

Secondary transfer points, by virtue of being down-the-line bulking areas, will be larger than the initial points. The deposits will be more generalized, because waste from multiple initial sources is combined. As with the initial transfer points, the trash held in these areas does not stay long. Unlike the initial points, however, these areas are located away from daily activities. The trash is already out of the way but not yet at its final destination. There may be less-rigorous policing of the site, resulting in an increase in the unintentional end deposition of items. Smaller items will continue to fall out of the system, but there may also be a number of larger items.

Final Depositories

Final depositories, dumps and landfills, are the end product of a waste management system. They are the largest, most generalized deposits in the system. The size of a waste dump can range from a pile pushed off the end of a pickup in the backcountry to a large sanitary landfill. What is common to all is that this is where all the items that did not escape at the earlier stages come to rest. The deposit will have the large items that are lacking in the transfer sites. Final depositories are the most removed from the source of the material contained in them. Being the endpoint they have a long life span. It is not surprising, therefore, that these are the most conspicuous waste deposits encountered by archaeologists.

Treatment

In relation to waste disposal, the term "treatment" means methods used to change the physical characteristics of waste materials. In most cases, the desired end result of waste treatment is to reduce the bulk of the material entering the depositories. The primary methods used for accomplishing this goal are relatively simple: separation, burning, and compaction.

Separation

Separation was the first of the attempts to reduce the bulk of material entering depositories. Classes of waste material were removed from the waste stream to be recycled or reused. Bulk is reduced simply because some materials do not reach the waste site.

Burning

Waste bulk is most effectively reduced through the burning of rubbish and garbage. Until recently, the treatment of waste through burning was common at open dumps particularly in municipal areas. Open burning did reduce the bulk, but it was not very thorough or efficient. It also created problems with smoke, odors, and uncontrolled fires.

In 1885, the first formal incinerator was opened at Governor's Island, New York. The incinerator did a more complete job than open burning. Many municipalities were also attracted to incinerators because the facilities could coincidentally be used to generate power. Of the approximately 180 built during this period, most were poorly constructed or managed, and by 1909 many had closed (Association of Science-Technology Centers Incorporated and the Smithsonian Institute Traveling Exhibition Services 1998).

Increasing urbanization in the early 1900s dramatically increased the amount of material entering urban dumps. This resulted in renewed attempts to reduce the bulk through burning, bringing the incinerator back into the waste management process. Incinerators also became common at the household and industrial level. Cities promoted generator incineration to reduce bulk and odors. Residents not only used the ever-popular burn barrel, but also could buy specially designed domestic incinerators that were installed at the home. Schools, hospitals, and factories all had on-site incinerators. By the 1940s, there were about 700 community incinerators and countless home and business incinerators operating throughout the country.

Open dump burning was continued in communities where incinerators were not available. Bulk was being reduced, but it was achieved at the cost of poor air quality. As a result, federal, state, and local governments began to ban incineration during the 1950s and 1960s. The Federal Clean Air Act of 1970 with its new regulations forced the closure of incinerators and ended open dump burning. Even the burn barrel came under attack. Burning as a waste treatment method had been greatly curtailed by the end of the 1970s.

More recently, there has been renewed interest in incineration, mostly to exploit the energy production properties of waste burning. There are now about 100 waste-to-energy incineration facilities located around the country.

Compaction

Once material has entered the waste site, its bulk can be reduced through crushing and compaction. As burning came under attack for its impacts to air quality, compaction became an increasingly popular method of waste treatment. Reductions in burning resulted in more bulk entering the waste sites and created a need for more waste-site capacity. Compaction of material as it entered the site became the only real alternative to incineration. Fortunately, the need to find an alternative to burning coincided with the development of heavy motorized equipment. In order to effectively compact waste material, the deposits had to be put under heavy weight. Dozers, tractors, and other machinery developed after World War II made this possible. While not as efficient in reducing bulk as burning, compaction did extend the life of landfills (open dumps having been prohibited in 1979) while avoiding the air pollution problem. Compaction has slowly expanded from landfills to industrial and household compaction. While not as popular as the dishwasher, household trash compactors are present in many homes.

HISTORICAL OVERVIEW OF TRASH DISPOSAL AND COLLECTION PRACTICES

General Overview

Waste Deposition

As with trash collection, for most of history individuals and groups were on their own in deciding on disposal methods for waste. The most basic form of disposal was to spread garbage in the area surrounding the house or business. Here livestock, particularly pigs, would feed on the waste. This was not an exclusively rural practice. Garbage and slop were cast into the streets of many urban areas for pigs and other scavengers to eat. The waste also provided rats, roaches, and other pests with feeding grounds. As the population of cities exploded in the late 1800s, the health dangers and basic offensiveness of this practice began to be recognized. By 1910, this method of disposing of garbage and slop had largely been abandoned.

Items that were not suitable for animal consumption and larger items were transported out of the way of home and commercial activities. The most common practice in areas where people were located for a length of time was to use an open dump. Fires would be used to reduce the volume of the material that remained. Later, as disposal of garbage by scattering in streets was prohibited, this waste also ended up in the large dumps. Here pigs and other animals were allowed to feed on the organic materials. Throughout the country, cities often established piggeries at dumps to house the herds of pigs that fed on the garbage.

The open dump with its exposed masses of waste created some serious problems. Most noticeable was the foul smell resulting from the decomposition of the organic wastes in the dumps. These wastes also provided a rich, damp environment in which flies, mosquitoes, rats, and other pests flourished. While burning the waste entering the dump reduced its volume and increased the use life of the facility, it produced large amounts of smoke. The burning in open dumps eventually was recognized as a major contributor to local air pollution and health problems (United States Environmental Protection Agency 2002).

Open dumps continued to be the primary disposal method until the 1960s, when landfills began to be widespread. Landfills differ from open dumps in that the waste is compacted rather than burned, and each day's deposit is covered with soil to prevent pests and odor. The first landfill was opened in Fresno, California, in 1937. The concept was used by the military in World War II. After the war, health issues made landfills more and more common. The environmental laws of the 1960s and 1970s reinforced their use. In 1979, the federal government prohibited open dumping, thus ending the era of dumps. The operation of a landfill requires a level of control on waste processing not practiced at an open dump. This meant that access to the community waste disposal facility was now controlled. Individuals either had their waste collected and disposed of by an official waste management system or had to remove the material to the landfill during its hours of operation and in many cases pay disposal fees. In addition, laws constrained the once-common methods of private on-site disposal by spreading, burning, and dumping.

Outside of these official systems, waste has always been disposed of at the edges of rural and urban communities or on lands surrounding isolated rural habitations. As the linked system of motorized vehicles and transportation routes improved, disposal of waste outside the official dumps began to take place farther from the source of generation. The rate of this type of disposal has increased as individuals seek to dispose of waste at times other than community dumping facility hours of operation, when they wanted to avoid fees, or when the landfill is not conveniently located.

Waste Collection

During the past 200 years, the nation's system of waste management has changed dramatically. For most of this time, the collection of waste was done on a household or business level. Those items that could not be disposed of by simple scattering were removed from activity areas and stored in areas around

the residence or commercial building. When the amount of material filled the designated storage space, it was removed to a secondary, and in some cases final, depository. In rural areas, the individual or household that generated the trash dealt with its removal, while most urban dwellers used the services of a professional waste collector. These early waste collectors, known as scavengers in some places, made collections on an irregular basis (Hickman 1999). This left trash standing in open containers for hours or even days waiting for removal. The dramatic increase in urban populations in the late 1800s coupled with increased acceptance of the germ theory of disease exposed the dangers inherent in this haphazard method of waste collection.

Things began to change in 1875 when legislation in Great Britain set up the first collection and disposition of community waste by local authorities (Community Environmental Resources Program 2003). By 1910, a number of towns had established collection systems run by the local government, but most communities in the United States still continued individual or contracted trash collection (Hickman 1999). By the 1950s, most cities throughout the country had set up a municipal trash collection system. Health and environmental laws in the 1960s and 1970s increasingly constrained waste disposal outside the official regional waste management systems. This was true even in rural communities.

Today waste collection by either local authorities or by waste management firms contracted to the local authority is present in nearly every community in the country. The more rural areas still contain a vestige of the old system in that many residents are responsible for collecting and removing their trash to bulking (transfer) stations for eventual disposition within a regional waste management system. Table 1 provides a time line for national and international trash disposal and collection practices.

History of Arizona Trash Disposal and Collection Practices

Trash Disposal in Spanish Colonial and Mexican Communities

Only a few historical references to trash disposal practices in the early Spanish Colonial and Mexican periods in Arizona were found. Most of what was found about trash disposal in this period came from archaeological research. Homer Thiel suggests that courtyard areas were kept clean of trash (Diehl et al 1997) (Thiel et al. 1995). Excavations within the boundaries of the former Tucson Presidio suggest that sheet trash may have been deposited outside of the eastern gate of the Presidio (Rawlinson 1987). Archaeological excavations carried out because of the Tucson urban renewal work identified trash pits and a trash concentration area within the north Presidio wall near an *horno* (Barnes 1983). A survey of the Barrio de Tubac identified a large refuse area, containing artifacts and animal bone, in the southeastern portion of the site near the Acequia para Regadio (Koczan 2002).

Trash Disposal and Collection Practices in the mid to late 1800s: Establishment of Municipal Sanitation Ordinances

Town populations in Arizona began to grow in the second half of the 1800s. The conclusion of the Gadsden Purchase of 1854, the Gold Rush of 1849, the Mormon colonization of the 1870-1880s, and the arrival of the railroad in the late 1870s and 1880s were all stimuli for increased population and urban development in many Arizona communities. The railroad also increased the availability, volume, and diversity of goods arriving in Arizona.

In the mid-1800s, trash disposal was unregulated in both urban and rural areas. Trash was often dumped in arroyos or other low areas, vacant lots, streets and alleys, and abandoned buildings. Abandoned privies and wells were used as convenient disposal areas for household trash. Animals roamed freely, feeding on trash and defecating in the streets and yards. Trash and dead animal carcasses accumulated in the streets. These less-than-ideal living conditions coupled with a number of outbreaks of disease in communities and the rise of germ theory resulted in the adoption of local sanitation ordinances.

Table 1. Waste Management Timeline

Year	Comments
Ca 1710	Colonists in Virginia commonly bury their trash. Holes are filled with building debris, broken glass and ceramics, oyster shells, and animal bones (Association of Science-Technology Centers Inc. and the Smithsonian Institute Traveling Exhibition Services 1998).
1860s	In Washington, D.C., people dump garbage and slop in the street, while pigs, rats, and cockroaches flourish.
1866	New York City's Metropolitan Board of Health declares war on garbage, forbidding the "throwing of dead animals, garbage or ashes into the streets" (Association of Science-Technology Centers Inc. and the Smithsonian Institute Traveling Exhibition Services 1998).
1880	New York City scavengers remove 15,000 horse carcasses from the city streets (Association of Science-Technology Centers Inc. and the Smithsonian Institute Traveling Exhibition Services 1998).
1885	The nation's first garbage incinerator is built on Governor's Island, New York. By 1908, 180 incinerators are built in the United States (United States Environmental Protection Agency 2002) and (Association of Science-Technology Centers Inc. and the Smithsonian Institute Traveling Exhibition Services 1998).
1895	The New York City Street Cleaning Commissioner sets up the first comprehensive system of public sector garbage management in the country (United States Environmental Protection Agency 2002).
1900s	"Piggeries" are developed in small to medium-sized towns in the United States. At these facilities, swine eat fresh or cooked food waste. It is estimated that 75 pigs consume 1 ton of refuse per day. Food waste is recycled as pig feed until the late 1960s (United States Environmental Protection Agency 2002). Greater acceptance of the germ theory of disease begins to shift the job of garbage removal from health departments to public works departments. Health officers, it is felt, should spend their time battling infectious diseases, not cleaning up "public nuisances" such as garbage (Association of Science-Technology Centers Inc. and the Smithsonian Institute Traveling Exhibition Services 1998).
Early 1900s	American cities begin to estimate and record collected wastes. According to one estimate, each American produced annually: 80-100 pounds of food waste; 50-100 pounds of rubbish; and 300-1,200 pounds of wood or coal ash (up to 1,400 pounds per person) (Association of Science-Technology Centers Inc. and the Smithsonian Institute Traveling Exhibition Services 1998).
1902	Of 161 cities in the United States surveyed in a Massachusetts Institute of Technology study, 75% provide regular collection of waste materials from people's homes (Association of Science-Technology Centers Inc. and the Smithsonian Institute Traveling Exhibition Services 1998) and. (United States Environmental Protection Agency 2002).
1909	102 of 180 incinerators built since 1885 are abandoned or dismantled. Many had been inadequately built or run. Also, America's abundant land and widely spaced population made dumping garbage cheaper and more practical (Association of Science-Technology Centers Inc. and the Smithsonian Institute Traveling Exhibition Services 1998).
1914	After a shaky start, incinerators increase in popularity in North American cities. About 300 incinerators operate in the United States and Canada (United States Environmental Protection Agency 2002).
1916	Major cities estimate that of the 1,000 to 1,750 pounds of waste generated by each person per year, 80% is coal or wood ash (Association of Science-Technology Centers Inc. and the Smithsonian Institute Traveling Exhibition Services 1998).
1920s	Using wetlands located near cities as a garbage disposal facility becomes popular. Garbage is placed in the wetlands in layers, with ash and dirt layers on top as cover (United States Environmental Protection Agency 2002).
1935	General Electric begins producing and marketing a garbage "disposal." Increasing use of disposals decreases amount of food waste entering the waste stream (Association of Science-Technology Centers Inc. and the Smithsonian Institute Traveling Exhibition Services 1998).

City charters and councils were established in many Arizona communities in the second half of the 1800s (Appendix B). Local governing bodies instituted ordinances to improve the safety and livability of communities. Along with fire ordinances, building codes, and controls on carrying and discharging of weapons within city limits, sanitary ordinances were among the first passed. These ordinances placed the primary responsibility and cost for trash disposal on the individual property owner/tenant. The role of the municipality was to promulgate and enforce the laws and regulations. The importance of these ordinances in early communities can be surmised by their being some of the first ordinances passed by councils and by the rather substantial penalties for violations. Penalties were often fines of up to $300 dollars and/or up to three months in jail.

The earliest ordinances identified for controlling the disposal of trash occurred in Tucson. Diehl et al. (1997) provide a good description of the sanitation conditions in Tucson during the Territorial period. Trash disposal was up to the discretion of individuals, resulting in trash-filled lots and filthy streets. The first Tucson ordinances for trash disposal appear in 1871 and 1872 (Diehl et al. 1997). These ordinances were passed to prevent slaughterhouses in the city limits, set fines for improper disposal of dead animals, required "persons occupying or owning a house or lot to keep the lot and adjoining streets and alleys" clean and trash free, and stipulated that refuse be placed in pits and then removed under the direction of the City Marshall every Saturday (Diehl 1997). With the involvement of the city marshal, Tucson also appears have had the earliest municipal involvement in organized trash pickup.

In the 1870s, irrigation ditches in and around Phoenix were used for washing, swimming, and trash disposal (Luckingham 1989). Trash was also deposited in lots and on the streets. Phoenix was incorporated with the signing of the Phoenix Charter Bill in 1881. In that same year, the City Council passed its first trash-related ordinance, which prohibited depositing filth on the streets and sidewalks or in canals and ditches. In the 1885 City Charter, the city marshal was charged with enforcing the ordinances to keep the city streets, alleys, lanes and common areas clean and unobstructed. The City of Phoenix also created the position of Health Officer to oversee matters of public health.

Most communities had a designated health officer position and/or a board with responsibilities for health issues. A physician, whose duties included the establishment and sometimes the enforcement of regulations concerning trash disposal, sewers, water, and infectious diseases, usually held the position. The village of Tombstone established a head of health position in 1882. The duties of the physician that held the position were to establish sanitation laws and regulations. In 1899, Jerome created a health officer position to enforce ordinances related to sanitary conditions. By the end of the century, the primary roles of the health officer in most communities became more focused on issues related to infectious diseases rather than trash disposal.

Early sanitation ordinances subsumed a number of different health and safety issues such as: prohibitions on slaughterhouses or animal rendering in the city limits; forbidding the running of livestock and dogs in the city limits; restrictions on draining privies; treatment and restriction concerning people with infectious diseases; and throwing or depositing trash, filth, and garbage on public streets, highways, or private premises. Ordinances also provided specific regulations on the disposal of ash. Ordinances regarding the disposal of wood and ash were the first to give specifics on the use of containers. In 1883, Prescott Ordinance No. 2 prohibited the disposal of wood or ash in wood containers, requiring metal containers that were to be placed at least 6 inches from structures.

In 1889, the 15th Territorial Legislature passed Resolution No. 12 relating to sanitation regulations for towns and villages. Outside of the more urban municipal communities, trash disposal remained unregulated and up to the discretion of the property owner.

Trash Disposal and Collection Practices in the Early 1900s: Increased Municipal Involvement

In the early 1900s, municipal governments became more directly involved in organized garbage and trash collection. Because of concerns about the influenza epidemic of 1919 and tuberculosis, the

responsibilities of the "health director" or "public health department" in many communities became more focused on issues related to infectious diseases. New bureaucratic structures were established to address issues of solid waste, water, and sewer systems. In some communities, street construction and repair were combined with garbage collection.

By the early 1900s, most incorporated communities had some type of ordinance relating to the disposal of garbage. Governments were directly involved in regular collection of household and business trash and garbage. The government structure for trash disposal varied from community to community but most moved from a simple contractual agreement with an individual for the removal of garbage to creating a governmental position or department that was responsible for trash removal issues and accountable to the mayor or city/town council. As part of the City Beautification Movement, many communities also sponsored "cleanup days," which involved the volunteer effort of all members of the community to beautify the town or city.

Ordinances for sanitation and public health laws became more comprehensive during this period. Many earlier ordinances were combined, expanded, and/or revised. Ordinances required covered metal containers of specific sizes for garbage and often required separate containment of different types of materials, such as separate containers for ash, garbage, and trash. Many ordinances also specified locations where garbage was to be stored on a property and specific days for garbage pickup. A number of communities prohibited the transport of garbage within the city without a city permit. Communities also began to charge fees for garbage pickup and designating specific locations outside of the city for the disposal of collected garbage.

In addition to designating community garbage dumps, at least two communities, Tucson and Phoenix, planned for garbage incinerators. Incinerators helped to reduce the volume of trash in the dumps, but they did pollute the air. Tucson's brick incinerator with an 80-foot chimney was constructed on St. Mary's Road in the early 1930s (Diehl et al. 1997). The incinerator was demolished in 1950.

During World War II, efforts were made to salvage metal and other types of recyclable materials for the war effort. In Tucson, a number of metal and rubber drives were organized with designated drop-off areas throughout the city (Diehl et al. 1997).

Trash Disposal and Collection Practices in the Mid 1900s: Federal Involvement

By the second half of the twentieth century, national Environmental Laws established standards for the treatment and disposal of solid waste. Prior to federal involvement, disposal of solid waste was a local issue in the United States. Local rules directed the dumping and burning of household and commercial waste at sites located away from population centers. After World War II, as population exploded and urban, suburban, and rural centers rapidly expanded, it became apparent that there were problems with this system. In 1948, concerns about the spread of disease, especially polio, prompted the United States Public Health Service to target for elimination suspected disease sources such as open dumps. These efforts began a movement to close open dumps and substitute sanitary landfills as the preferred alternative. By the middle of the 1960s Congress issued a statement that: "[s]olid waste collection and disposal activities create one of the most serious and most neglected aspects of environmental contamination affecting public health and welfare" (Brown, et al.1997).

As a result, Congress passed the first law to address the issue, the Solid Waste Disposal Act, in 1965. The thrust of this law was to aid states, local governments, and agencies in planning, installing, and operating solid waste management programs. With this legislation, the federal government stepped, however minimally, into this traditionally local situation. At this point the federal regulations acknowledged the health and safety issues posed by traditional dumping behavior, but did not address the local and state rules that permitted the problem.

An example of local controls in a rural area during the 1960s, is available in a description of Quartzsite's trash disposal practices:

> Health and Sanitation Committee reported garbage disposal service available by cooperating with Yuma County on the proposed area 2 miles north of Quartzsite on Highway 95. For a short time garbage collection was available, but not enough residents took advantage of it, preferring to either bury their garbage or take it to the dump. The "dump" became quite a joke in the early years – with much scrap material, tin, metal, boards and the like put there—if one met another there, someone would surely say, "Buying or selling?" It became almost an exchange (Allen 1982:13).

The first Federal law that placed limitations on companies involved in waste management came in 1970 when the Clean Air Act set standards for large-scale burning of solid waste. The law did not address the problem of backyard burning but focused on commercial and major disposal site incineration. Air emissions from these large-scale burning operations were being released directly into the atmosphere without being treated or filtered. The issue of backyard burning fell to state and local laws to restrict or prohibit.

Another step in the growing federal involvement with solid waste disposal came in 1972 when the Clean Water Act was passed. The act made it unlawful to release pollutants into navigable waters, unless a permit was obtained. While not directly aimed at municipal waste disposal sites, the act did serve notice that pollutant discharges from these sites were not acceptable.

It was not until 1976, however, with the passage of the Resource Conservation and Recovery Act (RCRA), that the federal government directly recognized solid waste management as a national issue. The RCRA was the first federal statue regarding solid waste management that encouraged environmentally sound solid waste management practices and provided regulation for cradle-to-grave procedures and treatments. It required the disposal of waste in sanitary landfills and prohibited the establishment of new open dumps. Existing open dumps were directed to close or upgrade to meet the environmental standards. The act also encouraged regional planning for solid waste management. With RCRA in place the EPA officially prohibited open dumping and set landfill standards in 1979. This was the first step in closing all open dumps. The 1984 Hazardous and Solid Waste Amendments to RCRA gave the EPA regulatory authority over landfills and the development of landfill criteria.

The transition from open dumps to landfills was not always easy for Arizona communities. The closing of open dumps on the Tonto National Forest caused a crisis for Payson, Star Valley, Pine, and Christopher Creek in 1974. The Star Valley and Ponderosa dumps were closed in March of 1974 and then reopened, because a local landfill was not yet available and residents were illegally dumping along Fossil Creek. On July 2, 1974, the Pine and Christopher Creek open dumps were closed for good under a federal order. A transfer station was established at the old Pine Dump where trash was hauled to the Star Valley Landfill. Transfer stations were also established between Christopher Creek and Kohl's Ranch. In that same year, landfills went into operation at Gisela, Tonto Basin, and Pinto Creek.

Appendix C contains a map of currently used landfills (Figure 10) and a listing of all closed landfills in Arizona. The next evolution of the life of a landfill is to find a new use and reclaim the large area consumed by solid waste. Two of the older landfills that are no longer in use have been turned into golf courses. These are the Silver Bell Golf Course in Tucson (1979) and the Cave Creek Municipal Golf Course in Phoenix (1984).

PROPERTY TYPES

Waste-Storage Features

A wide variety of properties are associated with the generation of waste (Table 2). These include, but are not limited to, domestic, commercial, industrial properties, or a combination of these. These sites are the point where waste first enters the waste disposal system, where it is first collected, and from where it is removed for off-site disposal.

Source properties may contain features that served as final depositories for waste materials. Some, such as trash scatters and middens, are the result of material escaping from the initial collection containers and forming an unintended accumulation. There are other instances where a pit may have been dug on-site to store waste or where waste was deliberately piled with no intention of removal from the site.

In some cases, features on a property or site that were not intended for the deposition of trash and garbage would become an on-site waste depository as a secondary or final function. Wells, old basements, and root cellars were especially popular for this use. A special mention needs to be made concerning privies. These structures were designed for the deposition of human waste but commonly also saw use as a depository for garbage and trash.

By their very nature **trash scatters** and **middens** will be located at, or adjacent to, the point of generation. The same applies with **privies**, **pits**, **wells,** and other subsurface features being used as trash depositories. For purposes of trash disposal, privies, pits, wells, trash-scatters, and middens located adjacent to the primary source of garbage (such as a home or a business) should be considered features of the primary property or site with which these individual features are associated.

Solid Waste Storage

Dumps

Dumps are the final depositories in the waste system. They are uncovered sites where waste is deposited. Rubbish and garbage in dumps usually represent secondary deposition and occur at a distance from the source of the trash. For purposes of National Register eligibility, this document identifies two different types of dumps. The two types of dumps are **waste piles** and **open dumps**. These two property types differ in scale, duration of use, association with the source of the trash, and the behavior resulting in the creation of the dump. Waste piles usually result from only one or two dumping episodes by one or a few individuals and do not represent a communally recognized disposal location. Open dumps are recognized locations within a communal disposal system. They are generally used repeatedly over a period of time with multiple sources that generated the garbage.

Both types of dumps occur at a distance from the source of the garbage. The distance will depend on a number of factors, including modes of transportation, geography, demography, wind patterns, and the location of roads in the area. Without a comprehensive study of the location of dumps with reference to the source(s) of the garbage, it is difficult to make any firm statements about expected patterns of distance. A cursory review of reports for this guidance document did seem to indicate that there might be some patterning. Communal open dumps in historical period urban settings did seem to be located between 1 and 3 miles from the community generating the materials in the dump. Waste piles appear to occur somewhat closer to the source of the trash, but can be as far as one mile or more from the source. Flagstaff's Ordinance No. 1, passed in 1894, required garbage be removed from the town to a location someplace ½ mile from the town limits and not less than 200 yards from any road.

Waste Piles

Waste piles are roughly bounded, open, mostly surficial, deposits of rubbish, garbage, or both. These piles may be found as integral parts of the source property or at a distance from the source. They represent a single or a minimal use of an area by an individual or group.

Waste piles are more variable than any other waste deposition properties. Like trash scatters and midden features, they can be found in proximity to the property generating the garbage or they may be located at considerable distances from their source. When located at the point of generation they can and should be considered features of the overall property. Isolated waste piles present a more difficult problem. When the source of the garbage and the waste pile have no clear physical proximity, it is difficult to establish an association. Without an association, a waste pile has limited or no research potential.

Factors that influence the distance between the source of the garbage and the waste pile include: modes of transportation modes, accessibility of roads, proximity of convenient disposal areas such as rivers and washes, availability of open land, and local trash ordinances and trash disposal systems. Improved transportation systems made it more convenient to dump garbage at a greater distance from the source. Local trash ordinance sometimes required a minimum distance for dumping.

In rural areas without organized waste management systems, garbage was spread for the livestock to feed on, and rubbish was gathered into a location out of the way in anticipation of eventual removal from the site. At a point when enough rubbish had accumulated, it would be loaded onto a vehicle and taken for final deposition off-site. This final depository was often at the edges of the property where a small open dump would form. At other times, the material was removed to the available surrounding vacant or public land resulting in isolated waste piles (Figure 1).

Urban areas developed more formalized waste management systems. Garbage ordinances were some of the first enacted in urban communities. These formalized systems brought controls and costs for the depositing of waste in official dumps. This did not however eliminate isolated waste piles. Individuals or groups might decide to rid themselves of the material by depositing it in unsanctioned locations for any number of reasons including the need to dispose of items too large to fit in official garbage receptacles or material not accepted at the official site. Items could be deposited outside the official waste management system because the operating hours were not convenient or to avoid the cost. Determining how the material was brought to the site of deposition can greatly aid in finding the source.

Open Dumps

Typically, open dumps are large areas where there has been repeated dumping of solid waste by a number of different individuals over a sustained period of time. An open dump may be designated and managed by the community or it may be a communally recognized area used for dumping with no clear management. They are like waste piles in that they are roughly bounded and open. They differ from waste piles by representing long-term deposition from a wide variety of sources. Open dumps may consist of a large pile of trash, a number of discrete piles of trash in an area, or a linear dispersal of trash. Open dumps associated with communities may have significant depth resulting from buildup over time.

Locations for dumps vary but are most often found at a distance from the community they serve. Drainages, stream banks, and other low-lying areas are the most popular sites for dumps. These locations are marginal lands to the community, allow some informal bounding of the area, and are out of sight. However removed from the community the dumps will be connected by one or more routes providing residents access to the sites.

Open dumps in urban areas created a number of problems because they were unsightly; created foul smells; emitted dangerous gases and smoke; attracted pests, such as rodents and insects; and spontaneously combusted. In order to keep down odor and pests, burning of deposits was a common occurrence. In some community dumps trenches were dug, filled with waste, and then covered with clean fill. These sites are transitional between dumps and landfills. Environmental laws in the 1960s began to force the closure of all open dumps in the country. The EPA banned open dumps in 1979.

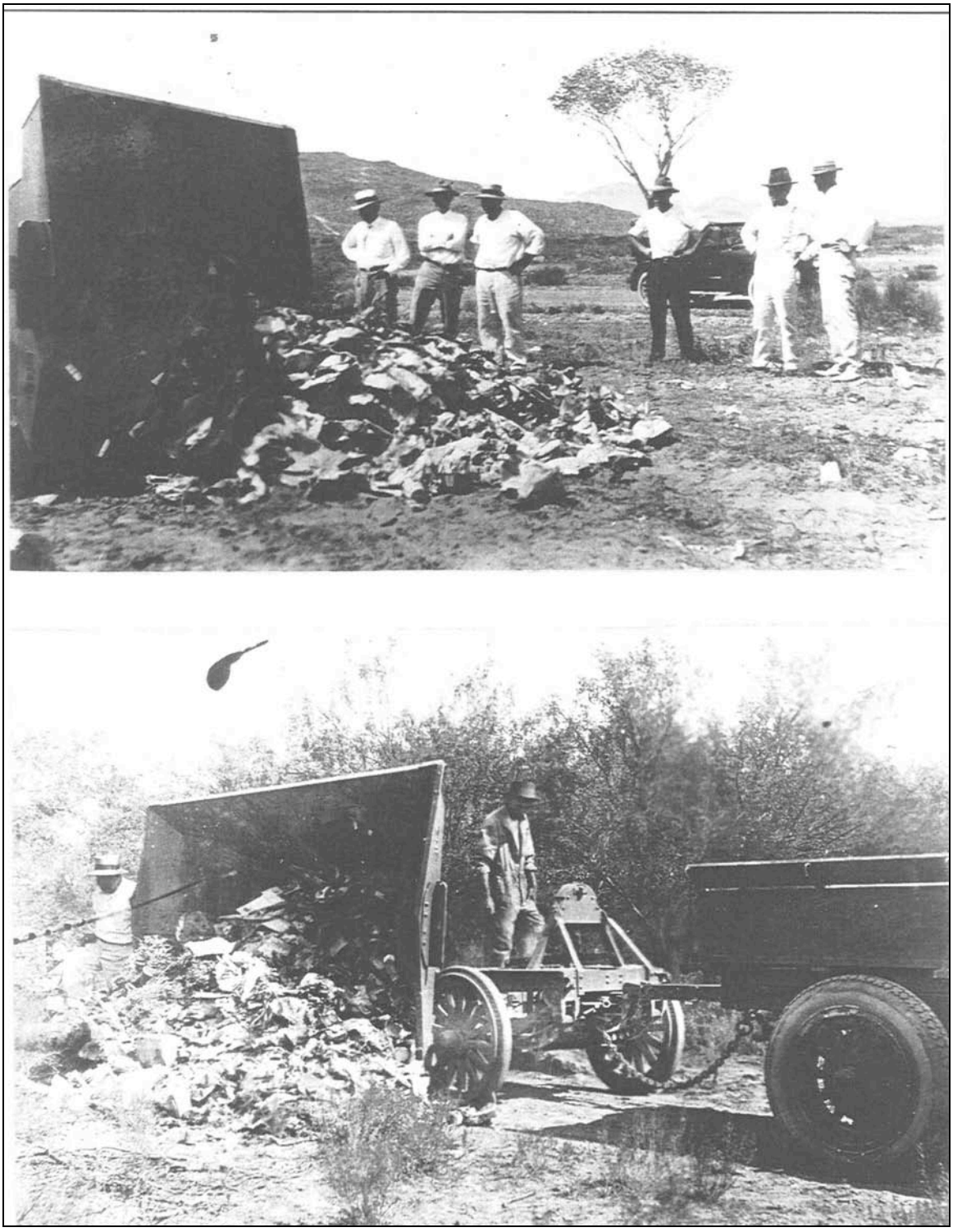

Figure 1. Tucson garbage wagons dumping trash in the early twentieth century (Diehl, et al. 1997: Figure 2.3; Arizona Historical Society, nos. 73815 and 73816)

Example of an open dump: Site AR-02-12-02-1167 (Old Superior Town Dump), Tonto National Forest (Stone and Hathaway 1992; Stokes 2002)

Located just outside the town of Superior, this site was used by the residents and businesses of the town as a community open dump from the 1920 until the early 1970s. As is typical of a long-term communal dump the site is large encompassing approximately 452,000 square feet. The dump is focused on the bank of a large drainage and extends as much as 300 feet away from this bank. Within this area there is a continuous heavy scattering of cultural material with several large concentrations. The vast majority of the artifacts are domestic (household) however building debris, business and industrial material, and automobiles are all common. The dump has its greatest depth along the drainage bank where it reaches 4 to 5 feet.

Landfills

Like dumps, landfills are community-based properties where waste materials from multiple sources are gathered together. Landfills are located far enough from the community to minimize visual, health, or odor problems but close enough for convenient access.

In recent years, regional landfills have become common. These sites bring together waste from multiple communities, creating a generalized deposit representing the depositional activities of many individuals. It is relatively easy to determine the source areas with which dumps and landfills are associated. That source area, however, can be rather large and varied.

Unlike dumps, landfills are engineered structures designed for the final, environmentally sensitive, deposition of waste material. Waste is spread in layers that are compacted to reduce volume. At the end of each day, the new layer is covered with clean dirt. Deposition and filling take place in specific cells of the landfill at specific times to maximize the life of the facility.

Solid Waste Transport

Transfer Stations

A transfer station is a facility intended to bulk waste from multiple sources for eventual removal to a dump or landfill. These sites usually include bins and compactors.

Formal transfer stations became common in the 1980s as the management of community waste fell under regulatory control. At first small isolated homes or communities without the ability to construct or operate environmentally sensitive waste facilities used transfer sites to enter their material into the formal waste stream. These are seen most often serving rural communities that lack access to a landfill.

The recent development of regional landfills has resulted in a new type of transfer station. Urban areas have begun to construct large transfer stations where massive amounts of waste are brought for storage, initial compaction, and removal to these regional landfills.

Table 2. Waste Management Property Types

Property/ Feature Name	National Register Property Type	Associated Property Type	Generator (Source)	Proximity to Property/ Generator	Use	Duration	Area & Size	Type of Waste	Deposits
Storage Properties/ Features									
Trash scatters/ middens	Features/ contributing elements to associated property	Homes, businesses	Single family/ business generator	Direct proximity or association with generator, within property boundary	Multiple- use episodes	Long term	Small area, dispersed surface	Domestic/ commercial	Small items, larger items usually removed
Privies/ wells	Features/ contributing elements to associated property	Homes, businesses	Single family/ business generator	Direct proximity or association with generator, within property boundary	Multiple-use episodes	Long term	Concentrated subsurface	Domestic/ personal	Small items, larger items usually removed
Dump: Waste Piles	Sites/ discontiguous districts	Homes, businesses, farmsteads, ranches	Single family/ business generator	Usually on vacant land/ distant from original generator	Single or minimal-use episodes	Short term	Concentrated surface scatter	Domestic/ personal/ commercial	Large to medium sized items
Dump: Open Dumps	Sites/districts	Towns, ranches, long term camps, industrial sites	Multiple generators	Associated with a community/ located a distance from point of generation	Multiple-use episodes	Long term use	Concentrated, dense large area & often has depth	Mixed domestic & commercial/ industrial	Large, medium and small items
Landfills	Structures	See Treatment Properties							
Transport Properties									
Transfer Station			Multiple	Located a distance from point of generation	Multiple-use episodes	Long term use		All solid waste	None

Table 2. Waste Management Property Types

Property/ Feature Name	National Register Property Type	Associated Property Type	Generator (Source)	Proximity to Property/ Generator	Use	Duration	Area & Size	Type of Waste	Deposits
Treatment Properties									
Piggeries	Associated with an open dump/ may have shade structures	Community dump, industrial facility	Multiple generators	Located at a distance from point of generation	Multiple use episodes	Long term		Domestic/ commercial	Organic, small items (bite sized)
Landfills	Structures	Cities and towns	Multiple generators	Located at a distance from point of generation	Multiple dumping episodes	Long term	Concentrated, very large area, deep, compacted, covered (controlled by environmental. laws)	Mixed domestic & commercial/ industrial	Large, medium, and small items
Incinerators	Structure or contributing element of an associated property	Community dump, industrial facility, or landfill	Multiple generators or single business	Located at a distance from point of generation	Multiple-burning episodes	Long-term	Ash scatter, remains of structure	Mixed domestic & commercial/ industrial	Large, medium, and small items

Solid Waste Treatment

Incinerators

An incinerator is a waste treatment facility where material is bulked and burned. The intent is to reduce volume, odor, and disease potential of raw waste in order to extend the life of the dump or landfill and make it a safer facility. Incineration of waste involves feeding the furnace, burning the waste, exhausting the gases to the atmosphere, and removing the residue from the furnace (Department of the Army 2001). The major components of a simple incineration system (Figure 2) include:

- Combustion chambers where waste is burned. These are typically constructed of an outer shell and an inner refractory material lining. Older built-up units usually have brick shell materials while newer units will have steel or cast iron. Most older incinerators have a single combustion chamber. Newer units usually have two combustion chambers (a primary for initial waste reduction and a secondary for gas combustion). The main combustion chamber will have a fixed grate or hearth, a waste charging door, ash removal doors, and a primary burner.
- Burners to ignite the waste. Incinerator burners are usually natural gas or oil fired, with controls ranging from manual on/off operation to fully automatic modulating systems.
- Fans to supply air for the combustion and aid in exhausting gases.
- Stack or chimney for final venting of gases (Department of the Army 2001).

Piggeries

A piggery is a primitive type of waste treatment facility where pigs were kept and released into an open dump to feed off the garbage. Large pig pens/corrals were most often located immediately adjacent to the dump.

Note: Litter is waste disposed outside of a regular garbage and trash collection/disposal system. Litter is not a property type but a loose accumulation of artifacts best viewed as either part of a larger property or as objects.

Areas where litter is found in concentrations are those areas where repeated use has resulted in the gradual accumulation of informally discarded waste (such as roadside accumulation). This is different from small items overlooked in a trash collection or disposal system in that these latter items were entered into the system but escaped, while litter was never entered into the system.

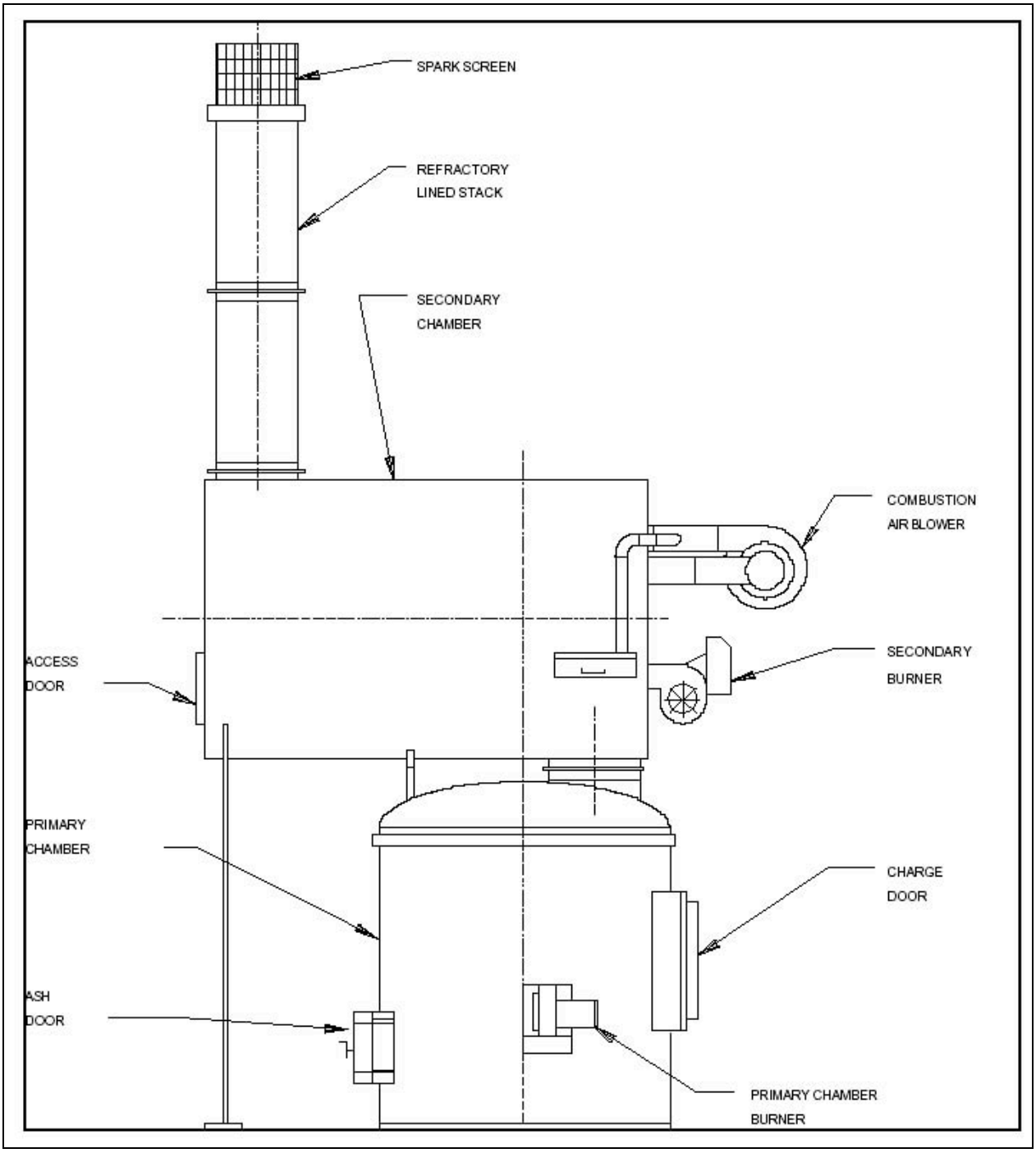

Figure 2. Diagram of a vertical dual chamber incinerator (Department of the Army 2001).

SITE INVESTIGATION IDENTIFICATION AND RECORDATION FOR WASTE PILES AND OPEN DUMPS

Guidance for Pre- and Post Survey Archival Research

Archival Research Prior to Survey

The goal of archival research prior to survey is to establish use histories for the study area. This research will heighten the awareness of field archaeologists to the range of possible historical resources. Research into land use is required to identify historic context(s) (see National Register Bulletin, *Guidelines for Evaluating and Registering Archaeological Sites*) as well as potential property types including refuse site locations. Guidance for identifying sources of archival information is provided in *Historical Archaeology in Arizona: A Research Guide*, which is available on the Arizona State Parks Website (http://www.pr.state.az.us).

Archival Map Research. Archival research should at a minimum include a search of historical-period map resources, including but not limited to General Land Office (GLO) Plat maps, United States Geological Survey (USGS) maps, any applicable Sanborn-Perris Fire Insurance Maps, and agency inventories such as AZSITE.

Identify Historic Contexts based on Land Use Histories. Check established state context studies, local histories, land-use records of federal and state land managing agencies, and tribal land-use histories.

Identify Transportation Corridors. Transportation corridors within and near the survey area may link the archaeological deposits with the source.

Post Survey Archival Research

The goal of post survey archival research is to obtain more detailed information on properties identified during the field survey. Based on information gathered during the field survey, carry out any additional archival research, which may include checking local histories and additional map resources and establish dates for diagnostic artifacts identified in the field. Observations should be made in the field about the general character of a trash deposit (domestic, industrial, etc.) as well as transportation and geographic features in the area that may aid in associating a trash deposit with properties identified through the field and earlier archival research.

Guidance for Identification

Basic Field-Survey Recording

Site or Feature Size. Describe the dispersal area(s) and make an assessment of depth and estimated number of artifacts present.

Description of Artifacts.

Artifact types. Provide an estimated percentage of the number of artifacts by material or functional class such as the percentage of metal cans to glass bottle, domestic versus industrial.

Diagnostic Information. Note any product names, manufacturing and technological characteristics, maker's marks, etc. to assist in temporal placement. Provide a listing or table of diagnostic artifacts. Drawings or photographs of maker's marks, etc., are also recommended. Note any temporally distinct areas on a site map.

Provide follow-up research on diagnostic artifacts observed in the field to obtain information such as production dates, location of production, etc.

General Observations on the Character of the Trash. Provide a general characterization of the trash (domestic, industrial, etc.) and the duration of use (single episode, periodic use, long-term use). Note any impacts to the site (integrity).

Setting. Describe the geographic area, proximity to nearest settlement or towns, the presence of access routes, other site-specific information, and any other properties in the area.

Map. Record the site and features using GPS coordinates and photographs. Plot the site and survey areas on a USGS map or in the AZSITE electronic GIS and data-entry module. If the dump is a feature of a larger site, record the boundaries of the dump in relation to the larger site's boundaries, datum, and other features.

Photographic Documentation. Provide photo documentation of the site, features, loci, artifacts, and view shed. Photographs may be in black and white, color, or a digital format as long as they have good clarity. Color photographs or a good description of color should be used when color is an important diagnostic attribute such as the color of Maker's marks on historical period ceramics.

Guidance for Documentation

Documentation methods for testing (Phase 1 data recovery) and/or data recovery may include non-collection (in-field analysis) and/or collection. **Both approaches require an approved testing and/or research design.** Decisions about the use of collection versus no collection approaches (or combination of both) to field documentation will be made on a project-by-project basis during the consultation process with the federal or state agency, other consulting parties, and the SHPO.

Non-collection Documentation

Non-collection documentation may be used to maximize information while reducing long-term storage and curation needs. Its application is more appropriate for surface sites. Because artifacts are not collected, it requires careful, detailed documentation in the field and survey personnel knowledgeable in the identification of historical period material culture. With noncollection documentation, artifacts are not curated for future research, thus this may not be the best approach for sites that will be totally destroyed.

Documentation with Collection

Documentation with collection is more appropriate for sites that will be totally destroyed and/or may be deeply stratified. The following provides information on the minimum level of information that should be recorded and methods that could be helpful during testing and data recovery for historical period waste piles and community open dumps. This guidance is specific to these property types and is intended to supplement but not replace other guidance and requirements of the Arizona State Museum and the State Historic Preservation Office, such as the Secretary of Interior's Standards and SHPO Standards for Documentation of Archaeological Properties on State Land and for State Projects.

Site Size. Describe the dispersal area(s) and make an assessment of the depth, and estimated number of artifacts present.

Detailed Observations of the Character of the Trash. Provide a general impression of the character of the trash (domestic, industrial, etc.) and the length of use (single episode, periodic use, long-term use). Note any impacts to the site (integrity). Note the ratios of different categories of trash, such as the ratio of domestic trash to construction related trash.

Setting. Describe the geographic area, the presence of access roads, and any other properties in the area that could be or are the source of the materials in the dumpsite.

Map. Record the site using GPS coordinates and photographs. Map the trash scatter on a USGS map or in AZSITE. If the trash scatter is a feature of a larger site, record the boundaries of the trash scatter in relation to the larger site's boundaries, datum, and other features. Indicate the location of any collection or diagnostic units/quadrants.

Photographic Documentation. Provide photo document of the site, features, loci, artifacts, and view shed. Photographs may be in black and white, color, or a digital format as long as they have good clarity. Color photographs or a good description of color should be used when color is an important diagnostic attribute such as the color of Maker's marks on historical period ceramics.

Sampling Strategies (may include but are not limited to):

Sample Units. Identify sample strategy and units, characterize the artifacts within the unit by material class. Perform an on-site analysis of diagnostic artifacts within each unit (see #2 under Basic Field Survey Recording). Record diagnostic artifacts.

Characterization Quadrants (Sterner and Majewski 1998). Divide each locus into quadrants. Perform on-site or laboratory analysis of artifacts within each quadrant. Artifacts are characterized by material class. Diagnostic artifacts are recorded in detail. This approach is useful with large trash disposal areas, multiple trash loci, and where there appears to be multiple episodes of dumping over a long period of time.

Artifact Analysis. In-field analysis and laboratory analysis may require additional research to identify technical aspects such as production dates and manufacturing locations for Maker's Marks, product names, patents, etc. This information is key for addressing research issues related to temporal parameters.

Health-and-Safety Concerns for Archaeological Field Staff

Archaeologists working with solid waste disposal properties need to be aware of the possible threats to health and safety. Most waste properties encountered by archaeologists are safe for investigation. Knowledge of the type and age of the deposit, land use in the area, and awareness of site conditions will go a long way toward understanding the risk waste property may pose. A wide variety of potentially hazardous chemicals, materials, and other matter may be found at these properties. It is important that an assessment of possible risk be conducted before any close investigation of these properties is undertaken. If it is felt at any time that a possible risk exists, all work should stop and the proper authorities should be notified. Let the experts determine whether or not the area is safe. Tetanus inoculations should be current for all personnel who are likely to handle sharp-edged objects during fieldwork. Following are a few, but not the only, points to consider when investigating a waste property.

- Any property that contains strange odors, odd soil discolorations, or other out-of-the ordinary conditions should be avoided.
- Properties with depth have a much higher possibility than surface sites of retaining liquids and decomposing materials, which may produce methane gases.
- Open dumps contain a wider variety of materials from more sources than isolated waste piles.
- Waste properties associated with source areas, such as mines, mills, or other processing plants that commonly use chemicals are of special concern.
- Care needs to be used in handling large, sharp, or rusted materials.

EVALUATION OF NATIONAL REGISTER ELIGIBILITY

Significance

In order to establish the eligibility of historic properties associated with waste management systems, it is critical to establish the significance of the property within a broader context. In the case of Criterion D, it is also necessary to identify important research issues. A historic context is based on establishing a specific historic theme or activity that occurred at an identifiable time period and within a specific geographic area. Identifying a historic context for trash-management properties requires:

- An understanding of the historic land use of the area. Establishing a historic context for a project area will usually require looking at land use beyond the boundaries of the specific project.
- Identification of other sites, features, buildings, or structures in the area that may be associated with the property;
- Familiarity with characteristics of the artifacts and artifact patterning within trash disposal areas that may provide clues to the source of the trash.

At a minimum, a culture history of the area should be consulted and General Land Office (GLO), USGS, and any existing Sanborn maps should be checked.

Integrity

A second aspect of establishing the National Register eligibility of a property is an assessment of the property's integrity – its ability to convey its significance. This assessment must take into account the physical features of the property and how they relate to its significance. If Criterion D is used, research goals will need to be identified.

Historical archaeological sites related to waste disposal contain some unique aspects of integrity. Because by definition the waste has been removed from its initial point of use and may be mixed with other deposits, the importance of the contextual relationship among and between items is vastly diminished. Therefore, the association of the deposit with the source of the trash is very important. The formalized structure of landfill deposition provides a better, albeit gross, stratigraphic relationship between deposits not seen in other large waste sites.

Because waste disposal sites are primarily composed of artifacts, the information that can be gathered by an analysis of the technological, stylistic, chronological, and functional attributes of the artifacts is of great importance. Waste disposal properties will need to have integrity of materials to be eligible under Criterion D. Waste treatment, especially burning, however can have a severe impact on artifacts, reducing many to an unidentifiable states. At properties where these destructive treatments have been routinely practiced the archaeological information potential of the deposits can be compromised.

Factors to Consider

Observations regarding the character of artifacts in the trash scatter may be useful in identifying a historic context. Size, variety, and density of the artifacts may provide clues as to the origin of the trash. Consider the following:

- At more permanent sites, trash will generally be removed from the immediate activity area. Often this will involve more than one episode of deposition. Items may be discarded close to the source initially and then moved to a distance somewhat farther away but still within the boundaries of the property. As the trash accumulates in this secondary location, it may be moved again to an area even more distant from the original site of origin and deposition. The act of moving the trash will result in different artifact patterning. Larger items will be removed farther and farther from the original site of disposal. The area closest to the activity area will be cleared of most trash

except for the smaller items that will be left behind. The final trash disposal area should have a higher percentage of larger artifacts.

- The artifacts in trash deposits associated with a single or a few sources will reflect the activities that generated them. For example, habitation sites will produce artifacts that reflect domestic activities and industrial sites will have higher proportions of items related to production and products.
- As transportation improves (better roads and vehicles), the final deposition of trash will tend to be farther from the source.
- The longer and larger the occupation, the greater the diversity and density of the trash dump.
- The longer and larger the occupation, the farther the trash probably will be from the original point of generation except in situations where there is a natural barrier such as a cliff or stream where trash can be deposited.
- Urban areas may have had organized trash pickup as early as the mid to late 1800s (Appendix B).
- Burning and burying of trash was common in urban areas in the 1800s and early 1900 but may still be practiced in some rural areas.
- Advances in waste management began in urban areas and moved to rural areas.

ELIGIBILITY OF WASTE MANAGEMENT PROPERTY TYPES

Waste Management Features

Trash Scatters/Middens/Pits

Trash scatters and middens are features or contributing resources to another primary property. As features or secondary resources to a primary property, they are not individually eligible; their eligibility is associated with the eligibility of the primary property.

Association with a Single Property

When the source of the trash is a home or a commercial building in an urban area, the trash scatter will be in close physical proximity to the structure and will primarily contain small items (Example 1). Larger items and accumulated trash from the property will usually be transported to another more distant location, but smaller items will remain as small trash scatters and/or in small trash pits within the property boundary, usually near the street or alley. Trash scatters and middens on residential and commercial properties will be less prevalent after their communities passed ordinances for the use of trash containers and trash collection were enacted (Appendix B).

Trash scatters may also be associated with properties such as temporary camps and transportation corridors (Example 2). In these cases, the trash scatter may be the only feature or one of only a few features left to define the property. In order to determine eligibility, (1) determine the significance of the primary property within a historic context, (2) determine the association of the trash scatters with the primary property, and (3) determine how and if the trash scatter contributes to the significance of the primary property.

Association with a District

Trash scatters and middens may also be contributing features or resources in a historic district such as middens associated with households within a residential historic district.

Privies

Privies are features or contributing resources to a primary property. They are often intended and sometimes unintended disposal areas for small trash items. Artifactual materials found in privies are usually well preserved and in clearly defined stratigraphic deposits. Trash deposited in privies provides a good source of temporal and material culture information about the larger property. For a discussion of the history, construction, and interpretation of privy deposits see Archaeological Investigations of Blocks 139 and 159 in Barrio Libre, Tucson, Arizona (Diehl et al. 2003). See Example 3.

Association with a Single Property

Privies are secondary resources (features) related to a primary resource, which was the source of the trash (generator). Privies are found in close physical proximity to the primary property, usually within the boundaries of the property.

Association with a District

Privies may also be contributing resources to a historic district, such as a historic residential or commercial district. The eligibility of the privy or privies will again be dependent on the significance of the district as a whole.

Wells

While the primary use of a well is not for trash disposal, wells that are out of use do often become convenient trash receptacles. Wells will usually be a secondary feature or element to a primary property and subject to the eligible of the primary property.

Note: Wells are engineered structures and as such may be eligible under Criterion C for their construction characteristics. A discussion of well typology and eligibility is beyond the scope of this paper, but historical-period trash deposited in a well may contribute to an understanding of the age of a well and its association with other properties.

Example 1. Features Associated with an Eligible Property/Home Site, AZ T:4:55 (ASM) (Ayres and Seymour 1990)

The 1930s Brown Homestead in Yavapai County was first identified in a survey for the New Waddell Dam sponsored by the Bureau of Reclamation. The site was primarily archaeological with very few structural remains of original buildings. Ten features were identified. These included the remains of a privy, an adobe room, a trash scatter adjacent to the house, a frame house, a rock wall, an L-shaped pit, a trash scatter located at the edge of the property at the foot of a terrace, a stock tank, a well, and a cobble alignment (Figure 3). The trash scatter adjacent to the adobe room and frame house consisted of "a moderate scatter of fragmentary glass, ceramics, and cans" covering a diameter of about 30 feet (Ayres 1990:21). The trash scatter at the edge of the site contained some smaller metal items, such as cans, but also a number of larger items such as automobile seat springs and a muffler, a 50-gallon drum, and the head end of a bed frame. The entire site was determined eligible for the National Register under Criterion D because of its potential to yield important information on homesteading activities and lifeways.

Example 2, Feature Associated with an Eligible Property/Transportation Corridor and Temporary Camps, AR-03-12-05-511, Tonto National Forest (Sullivan 1988)

This site is a dense scatter of historical-period waste located in an isolated spot a couple of miles north of Young, Arizona. The majority of the material on the site is domestic in nature (cans, bottles, and ceramics). Temporal indicators point to a deposition date between the late 1930s and the early 1940s. Immediately east of the site is a two-track road that ends a mile north of the site and which, on the south, ties indirectly into the road system leading into Young. Research into land use in the area revealed that the site was located within the boundaries of the Heber-Reno Sheep Driveway used to drive sheep from above the Mogollon Rim to the Salt River valley. This area of the driveway served as a bedding ground where the sheep were allowed to rest. Archaeological survey of the bedding grounds identified several sites containing historical-period materials very similar to those found at site 05-511. It became clear that these sites were the remains of camps used by shepherds while the sheep were resting. Being temporary camps no remains of shelters or structures were present. The discarded food and serving items were all that existed to mark the use of the site. For purposes of National Register evaluation, the trash scatter would be considered a contributing feature of the Heber-Reno Sheep Driveway, which is eligible for the National Register under Criterion A and D for its association with commercial Basque shepherding in Arizona between 1900 and 1960. Associated state historic contexts would include Arizona commerce, sheep herding, historic trails, and Basque history.

Example 3. Features Associated with an Eligible District (Diehl et al. 2003)

A redevelopment project in Tucson included Block 139, which was part of a larger historic Mexican-American neighborhood known as Barrio Libre. A portion of Barrio Libre still has standing architectural properties and is listed in the National Register of Historic Places as a historic district. Although Block 139 is outside the boundaries of the architecturally defined Barrio Libre National Register District, it is adjacent to the district and within the original historical neighborhood. The late 1880-1950 buildings in Block 139 were demolished in the 1960s but subsurface archaeological remains associated with these former buildings could contribute important information about life in the barrio and the early history of Tucson. An archaeological investigation of Block 139 identified 35 features. These features included five privies, four trash pits, and one trash-filled depression. The information obtained from these features was used to address research issues related to material culture, land use, ethnicity, and dietary practices.

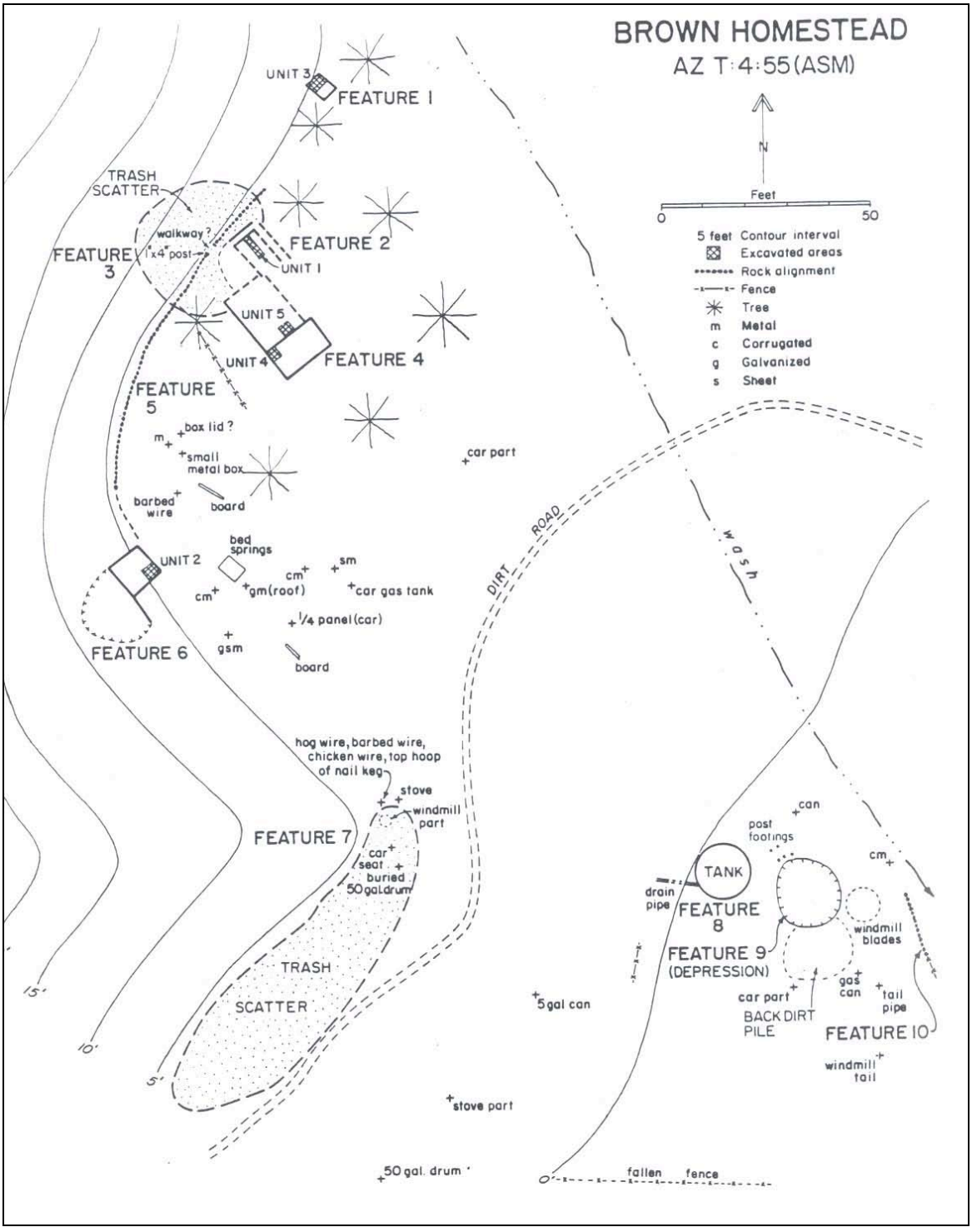

Figure 3. Site map of AZ T:4:55 (ASM), the Brown Homestead (Ayres and Seymour 1990:Figure 6).

Waste Management Properties

Dumps

Dumps represent final depositories in the waste system. They usually represent the secondary place of deposition and occur at a distance from the source of the trash. For aiding in determinations of eligibility, two different types of dumps have been identified–waste piles and open dumps. These have been identified as two different variations of a property type because they differ in scale, duration of use, and association with the generator.

Waste Piles

Waste piles are the most problematic property type for National Register eligibility. They represent a secondary disposal area. They occur when accumulated discarded items are removed from the point of generation. Waste piles usually represent only one or a few episodes of dumping, usually one or two truck- or wagonloads of garbage. They are not part of a communally recognized garbage disposal area.

When considering National Register eligibility, waste piles have historical meaning or significance through their association with the source. Because waste piles usually do not occur in close proximity to the source property (isolated waste piles), they may be viewed as individual sites/properties and assigned site numbers. Determining the association between the waste pile and its source of generation is critical to establishing a National Register context. Identifying the associated property can be difficult and will require archival research, often involving an area larger than the immediate project area (Area of Potential Effect).

Knowing the eligibility of the source property will aid in determining the eligibility of the associated waste pile. In many survey situations, it may be impossible, due to land-jurisdiction issues, project boundaries, etc., to evaluate the eligibility of the property that generated the trash pile. In these cases, identify the context for the associated property. If the associated property has significance within the context and the trash pile can contribute important research information about the property, then the trash pile is eligible. For management purposes, trash piles will usually be assigned their own site number.

The steps in evaluating a waste pile for the State and National Registers are:

1) Identify the property that was the source (generated the materials) of the waste pile.
2) Identify the historic context(s) for the source property and waste pile.
3) If possible, determine the National Register status of the source property.
4) Evaluate the integrity of the waste pile and its potential to contribute important information about the associated source property or associated cntext.

Eligible

If an association is established with an eligible property and context, the waste pile is most likely to be eligible under Criterion D. To be eligible under D, the waste pile must have the potential to yield important information that would contribute to an understanding of the associated property and context. The waste pile would have to have integrity of location, materials, and association.

Not Eligible

If the associated source property or context cannot be identified, the waste pile cannot be determined eligible for the State and National Registers of Historic Places. If the associated source property is identified, but the waste pile lacks integrity, will not provide important information, or will only provide redundant information, it should not be determined eligible for the State/National Register of Historic Places.

Example 4. Eligible Waste Pile with Known Source Property

Site AR-03-12-04-1470, Tonto National Forest (Weaver 1998)

This site, located just off State Route 260 about 12 miles east of Kohl's Ranch, Arizona, consists of an extensive concentration of domestic refuse, construction debris, and automotive parts. Notable among the assemblage are numerous large maple syrup cans. Examination of the site indicated that the material was deposited between the late 1940s and mid-1950s. The character and density of the waste suggested that the source was not primarily a household or households but instead was related to construction activities. Possible source areas for the waste included random dumping by highway users, Kohl's Ranch, a Boy Scout camp located nearby, or the community of Christopher Creek. A closer examination of the site, including moving some materials in search for source indications, revealed discarded signs used at the Boy Scout camp. This established the source identity with a high degree of confidence. The National Register eligibility of this site is therefore tied to that of the source area. Unfortunately the source area is located on private land and not accessible for National Register evaluation. Nonetheless, it is possible to say that the waste site is eligible under Criterion D for the information it contains in relation to the historic contexts of recreation and the history of Boy Scouting in Arizona.

Example 5. Ineligible Waste Pile, Source Property Unknown

Site AR-03-12-04-1397, Tonto National Forest (Hathaway 1999)

This site consists of a small (approximately 200 items) concentration of primarily domestic trash deposited adjacent to State Route 87 north of Payson. The majority of the material was manufactured in the 1930s and 1940s and was probably deposited at the site in the late 1940s. Among the cans, bottles, and other items was a metal plate with "J.LAZEAR" formed by holes punched through the plate. This plate provided the best opportunity to establish an association for this trash deposit. The Lazear's are a pioneer family in the Pine and Payson areas. Some basic research into the family established they had settled in the Pine area with later generations moving to Payson and Star Valley areas. There are several members of the family whose first name began with the letter "J." Unfortunately, all of these had either relocated far from the Payson and Pine area or had died prior to the probable deposition date of the trash. No family landholdings or residences were located within several miles of the site. The closest of these had no direct road connection to the area where the material was found. As a result, while it is possible to make a connection between the site and the Lazear family this connection is limited to the name being on the artifact. No direct association of the site to any individual Lazear or to any property used by the Lazear family was possible. The source of the trash was not identified. The site has not been formally evaluated for National Register eligibility in the hope that additional research will be able to establish an association with a source property, but based on current information it would not be eligible.

Exceptions

There may be situations where information about a particular period or theme in history is so rare that the waste pile may be significant enough to be eligible without its associated property. An example of this could be a trash pile associated with the early Spanish Colonial period.

Discontiguous District

State and National Register Districts are usually bounded geographic areas of contiguous historical or archaeological properties. A historic district may contain discontiguous elements, when visual continuity is not a factor of historic significance, when resources are geographically separated, and when

intervening space lacks significance (Department of the Interior 1997, National Register Bulletin, *How to Apply the National Register Criteria for Evaluation*: 6). In order to establish a discontiguous district, the entire district must be evaluated for eligibility. Waste piles may be contributing features or resources to a discontiguous historic district, such as a ranch or mining property.

Open Dumps

Like waste piles, open dumps occur at a distance from the original source of the trash. Unlike waste piles, open dumps result from intensive use (repeated dumping) by more than one generator and are in locations that are recognized as part of a formal or informal trash disposal system.

Open dumps occur at different scales and have different time depth. They may be associated with smaller properties such as ranches and farms, a single or multiple business(es)and industry(ies), or military installations that have used a single area for the dumping of trash over a period of time. At its largest scale, an open dump is associated with a town or city (communal). A mining camp, military post, etc. may use a designated dump intensively for a few years, while a community may use a designated dump area for decades.

Materials in an open communal dump will represent a range of different activities while materials at an industrial site may reflect limited activities. Garbage deposits may be primarily concentrated in one area, dispersed widely over an area, or made up of a number of distinct smaller concentrations (loci) of trash deposits. The community dump in Superior consists of a continuous linear deposit of trash and garbage. The Slash Z Ranch dump consisted of a number of different loci within a 150-by-75 yard area (Example 6).

Although community dumps are usually located at a distance from the generators, the source of the trash is usually easily identifiable because of the dump's size, general proximity to a populated center, and volume and character of diagnostic artifacts. There may also be archival references to the dump.

Eligible

For State/National Register considerations, an open community dump is a site and may be individually determined eligible for the National Register. Because of the volume and diversity of artifacts contained in open community dumps, they may be used to address a wide variety of research issues at the community, regional, and national levels. For this reason, they will most often be eligible under Criterion D. Important research issues include but are not limited to: trade, production, socioeconomic status, dietary habits, ethnicity, health/hygiene, technology, trash disposal methods, and demography. In order to be eligible under criterion D, an open dump must have integrity of location, materials, and association (Examples 6 and 7).

Because dumps, unlike waste piles, are community based, more consideration needs to be given to the possibility that they may be eligible under Criterion A, B, or C.

To be eligible under Criterion A, an open dump would need to be associated with an important historical event such as a crisis in trash management, a major policy change in trash disposal, the location of a study or a technological innovation that resulted in changes in policy or practices in waste management, etc. The site would need to have, at a minimum, integrity of location, association, and materials.

To be eligible under Criterion B, the site would have to be associated with an important person in the history of trash disposal, research, or policy. The dump would have to be the primary or only site associated with the person's accomplishment. At a minimum, the site would need integrity of association, location, and materials.

In order to be eligible under Criterion C, an open dump would need to embody distinctive construction or design characteristics. Open communal dumps usually are not designed or constructed in any way, but cut-and-fill methods were used in some open dumps as a means of dealing with problems of

trash volume, smell, and air pollution. This was a transitional technology used before the introduction of engineered and designed landfills. An open dump that provided the earliest or best example of the cut-and-fill method could be eligible under Criterion C if it retained integrity of location, material, association, and design.

Example 6. Eligible Dump Associated with a Ranch Property,
AZ EE:7:201(ASM)(Sterner and Majewski 1998)

The Slash Z Ranch Dump site was identified and investigated by Sterner and Majewski (1998). The site, which was located about 0.6 miles from the Slash Z Ranch, was a garbage disposal area for the ranch from the 1930s to the 1950s. The communal open dump consisted of six concentrated loci of garbage representing both single and multiple refuse disposal episodes spread over a 150-by-75 yard area (Figure 4). The integrity of the site was good with no evidence of disturbance. The site referred to in the report as a "support-level" site, was determined eligible for the National Register under Criterion D for its potential to provide important information related to research issues about the Slash Z Ranch. Historic contexts for the research included historical-period ranching and homesteading in the area. Because the ranch headquarters had few remaining artifacts, the open dump site provided the primary source of material culture information for the ranch.

Example 7. Eligible Dump Associated with a Town Site,
AZ U:9:91 (ASU) (Griffith 1987)

AZ U:9:91 (ASU) was a small trash dump located on the north bank of the Salt River across from the town of Tempe. It was eligible under Criterion D because it provided important information about the material culture of Tempe in the late 1800s–early 1900s as well as information related to national commercial trade networks during that period. The dump was only used periodically during the historical period when the vehicular bridge across the Salt River was operational. Materials at the dump consisted of domestic, commercial, and medical trash. No references to the dump were identified during archival research. The association of the dump with Tempe was identified on the basis of artifacts at the site that came from the Tempe Normal School (later ASU) and the Laird and Dines Drug Store in downtown Tempe.

Districts

Open Dumps could have a number of associated properties and/or features, such as incinerators, processing areas, piggeries, etc. All of these properties together would represent a district.

Landfills

Landfills share the constraints of location, duration and intensity of use, with the highly generalized nature of deposits that characterize open dumps. They differ in several significant ways from open dumps. Landfills are engineered so that the material deposited is kept in an environmentally sensitive position. This engineering necessitates the waste being buried on a daily basis, resulting in a deposit with considerable depth. The cost of these environmental controls and the need for more formal operational procedures favors centralized facilities. As a result, landfills are usually large. They are not directly associated with smaller communal properties but with urban and suburban communities. Their association with rural areas is less direct, because multiple rural communities use the same centralized landfill. Recently, the concept of shared landfill use has spread to urban and suburban areas where several communities share the use and costs of massive regional landfills.

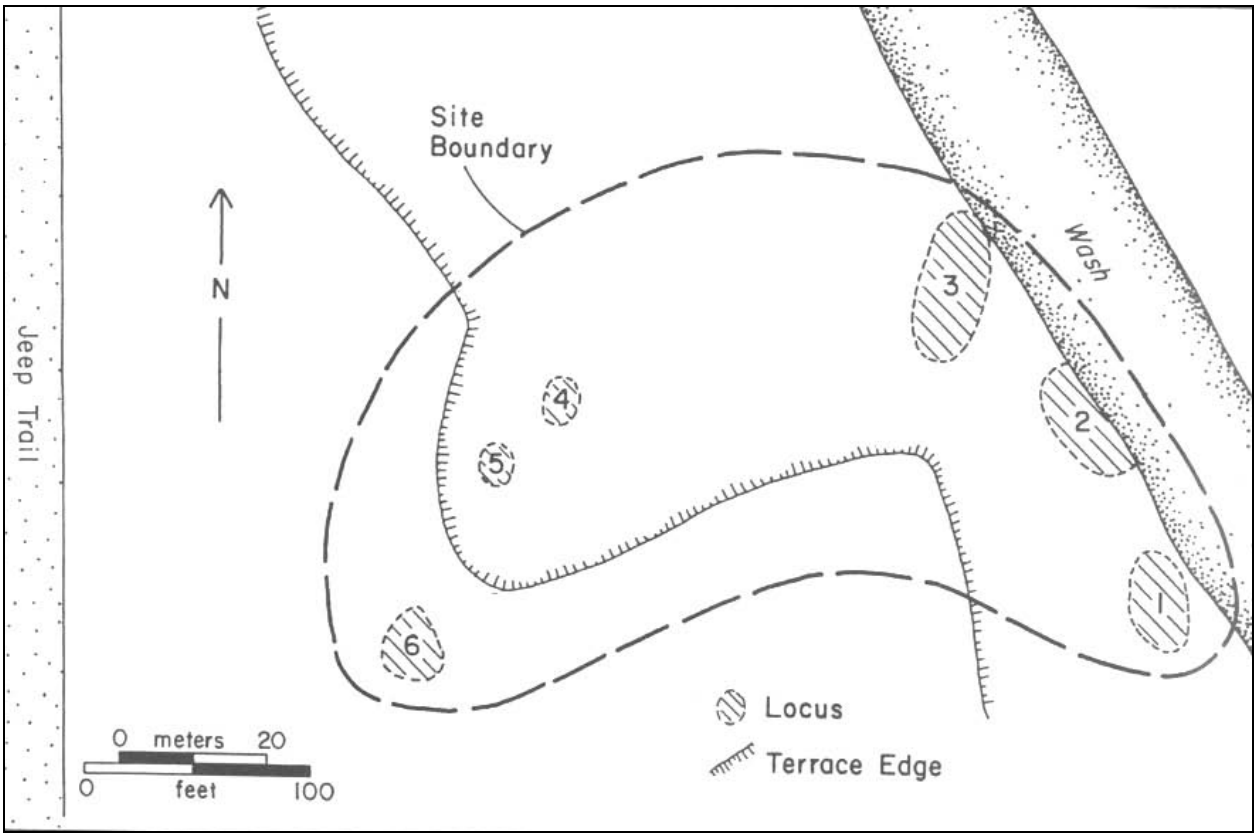

Figure 4. Site map of AZ EE:7:201(ASM), the Slash Z dump site (Sterner and Majewski 1998:Figure 53).

Within the parameters of State and National Register guidelines, landfills are considered to be structures, which may be individually eligible for the National Register. They are engineered constructions made for a purpose other than human shelter. In order to provide an environmentally safe facility, landfills contain a variety of liners, drains, dams, monitoring devices, and vents. In addition to the daily operation, the landfill requires coordination and planning to ensure that each day's waste is deposited correctly, compacted, and covered with dirt at the end of the day. The structural aspects of a landfill will be most important in considering National Register eligibility under Criterion C. Landfills that contain distinctive design, construction, or operational characteristics would be eligible under this criterion. To be eligible under Criterion C, a landfill must contain integrity of location, design, material, workmanship, and association.

In addition, the great amount and diversity of waste contained in a landfill may be used to explore a wide range of issues directed to community, regional, and national scale research. Because of this they can also be considered eligible under Criterion D. Under this criterion, landfills share the same research issues as dumps. Studies of dietary habits, socioeconomic relations, trade, ethnicity, health and hygiene, technological issues, and demography all are valid research goals when examining landfill deposits. Integrity of location, materials, and association are critical under this criterion.

It is possible for a landfill to be eligible under either Criteria A or B (Example 8). To be eligible under Criterion A, a landfill would need to be associated with an important event involving solid waste management, such as administrative or operational advances, a critical historical point at which the landfill played an important role, or important policy changes widely impacting how waste is managed. At a minimum, the landfill would have to have integrity of location, association, and materials. Under

Criterion B, the landfill's association with an important person is paramount. That individual's importance would have to be directly related to the landfill and the history of solid waste management. Location, materials, and association are the important aspects of the property that must retain integrity in order for the landfill to be eligible for the State and National Registers under this criterion.

Example 8. National Register-Listed Sanitary Landfill
(Fresno Pacific University 2003)

The Fresno Sanitary Landfill operated between 1937 and 1987. It covers an area of about 140 acres and is located 3 miles from Fresco, California. The landfill is significant as the "oldest true" sanitary landfill in the United States. It is also significant for its association with Jean Vincenz (1894-1989) who is the man responsible for the development, implementation, and dissemination of the principles of the sanitary landfill in the United States. He served as the commissioner of public works, city engineer, and manager of utilities in Fresno between 1931 and 1941. The Fresno Sanitary Landfill was designated a National Historic Landmark in 2001.

Incinerators

Incinerators were used at facilities such as community dumps, military bases, schools, hospitals, and even homes. The number of existing historical period incinerators in Arizona is currently unknown. Two incinerators are listed on the National Register as contributors (Examples 9 and 10) to military base districts.

Incinerators are structures that may be eligible individually or as part of a district. In most situations they will be contributing elements to a district, such as a military base, a school or hospital campus, or a community open dump. In these situations the significance of the incinerator will be tied to the significance of the district.

Based on current information, there seem to be only a few existing examples of this once-common property type. Individually eligible incinerators may be eligible under Criterion C as rare examples of a once-common type or for distinctive construction, design, or engineering. At a minimum, to be eligible under Criterion C an incinerator should have its walls and smoke stack. To be eligible for construction, design, or engineering, it should have integrity of materials, design, feeling, and workmanship.

Example 9. Incinerator Eligible under Criterion A and C
as a Contributor to a District, Fort Tuthill Historic District

A stone incinerator, AZ I:14:340 (ASM), constructed at Fort Tuthill in 1930, is adjacent to a historical-period trash dump, AZ I:14:339 (ASM). A recent visit to the dump confirmed that it no longer exists. The incinerator is one of the earliest structures built at the site and one of only two stone structures at the fort. Although it is in partial ruin, it still retains its stone walls and smoke stack. It was listed as a contributing property to the Fort Tuthill Historic District on April 4, 2004. The district is eligible under Criteria A and C.

Piggeries

A piggery is a primitive type of waste treatment facility where pigs were kept and released into an open dump to feed off the garbage. Large pig pens/corrals were most often located immediately adjacent to the dump. Pictures from a piggery in New Jersey show a number of wooden enclosures and structures as well as metal sterilization chambers (Figure 5). Although it was common to feed waste to pigs, the piggeries referred to in this section are associated with larger programs of waste disposal at the community level.

James E. Ayres identified a number of references in Tucson papers related to pigs and pig farming in the Tucson. He provided the following information:

> Based on these articles (newspaper) alone, the earliest reference to pig farming is from 1882. The latest reference I have found so far is July 1895 (References are primarily about Chinese pig farms). Chinese first came to Tucson ca. 1875. I found no references to Hispanic or Euro-American hog farms in Tucson area. In 1890, Mr. Schumacker, a Tucson butcher, purchased 75 hogs from "one" of the Chinese hog farms. Note that it says "one" of the hog farms, implying there was more than one farm in 1890 (Arizona Weekly Citizen 1890b). Schumacker's customers were primarily Hispanic and Euro-American. The number of hogs purchased is quite large, suggesting that these farms were relatively large-scale operations at that time.
>
> There are also a couple of references to Chinese "slop" or "swill" handlers. Undoubtedly, the pig farmers were collecting waste from restaurants or other sources to feed their pigs. Also, the Chinese vegetable gardens would have generated a lot of waste in the form of overripe vegetables, melons, carrot tops, etc. (James E. Ayres 2004).

Specific newspaper references to hog and pig farms and swill gatherers used by James E. Ayres are listed in References Cited and Appendix B, Time Line for City of Tucson Trash Ordinances and Disposal.

There may have been only one or two Chinese hog farms along the Santa Cruz River at any one time, but it is likely that they supplied both the Chinese demand for pork and most or all of the Hispanic and Euro-American communities as well.

This property type is not well represented in historical or archaeological survey records in Arizona. Given the lack of examples of this property type it is difficult to know the range of features associated with these properties in Arizona or to provide definitive guidance on the extent of integrity needed for eligibility. To be eligible under Criterion A, the piggery would need to be associated with an important event in communal trash disposal practices in Arizona. To be eligible under Criterion C, the piggery would have to have high integrity of association, location, design, workmanship, and materials. In relationship to other piggeries, it would have to be the best example or a rare example of a once common type. Piggeries could also be contributors to a district. To be eligible under Criterion D, a piggery would need to have integrity of location, association, and materials and be able to address important research questions about waste management. The one archaeological example that we identified during research for this project was the hog farm located between Camp I and Camp II at the WWII Poston Japanese Relocation Center on the Colorado River Indian Tribes Reservation near Parker.

Example 10 Piggery Eligible Under Criterion A and D as a contributing property to the National Register eligible Poston Japanese American Relocation Center (Burton et.al. 1999)

The Poston WWII Japanese American Relocation Center consists of three separate camps (Camp I, Camp II, and Camp III) located on the Colorado River Tribes Reservation (Figure 6). Close to 18,000 Japanese Americans were interned at the three camps from 1942 to 1945. The hog farm was located between Camp I and Camp II and "consisted of 12 pens with feeding floors, six farrowing pens, and pastures. Facilities also included two small watchman's houses (8 foot by 10 foot, and 10 foot by 14 foot in size), a 20 foot by 100 foot warehouse, a 30 foot by 36 foot processing house, a motor house, cold storage, an 18 ½ by 33 foot slaughter house, a latrine, a water tank, a pump house, a garbage can washing station, and a fuel tank" (Burton et al 1999:228) (Figure 7). The hogs subsisted primarily on center garbage (Burton et al. 1999:228). Today the only visible remains of the hog farm are slabs. One of the slabs has an inscription "div. of Soil 3/21/43" (Figure 8 and Figure 9) (Burton et al. 1999:236 and 238).

The Poston hog farm is eligible as a contributing element to a National Register District that may also be eligible as a National Historic Landmark. The district is eligible under criteria A, B, C and D.

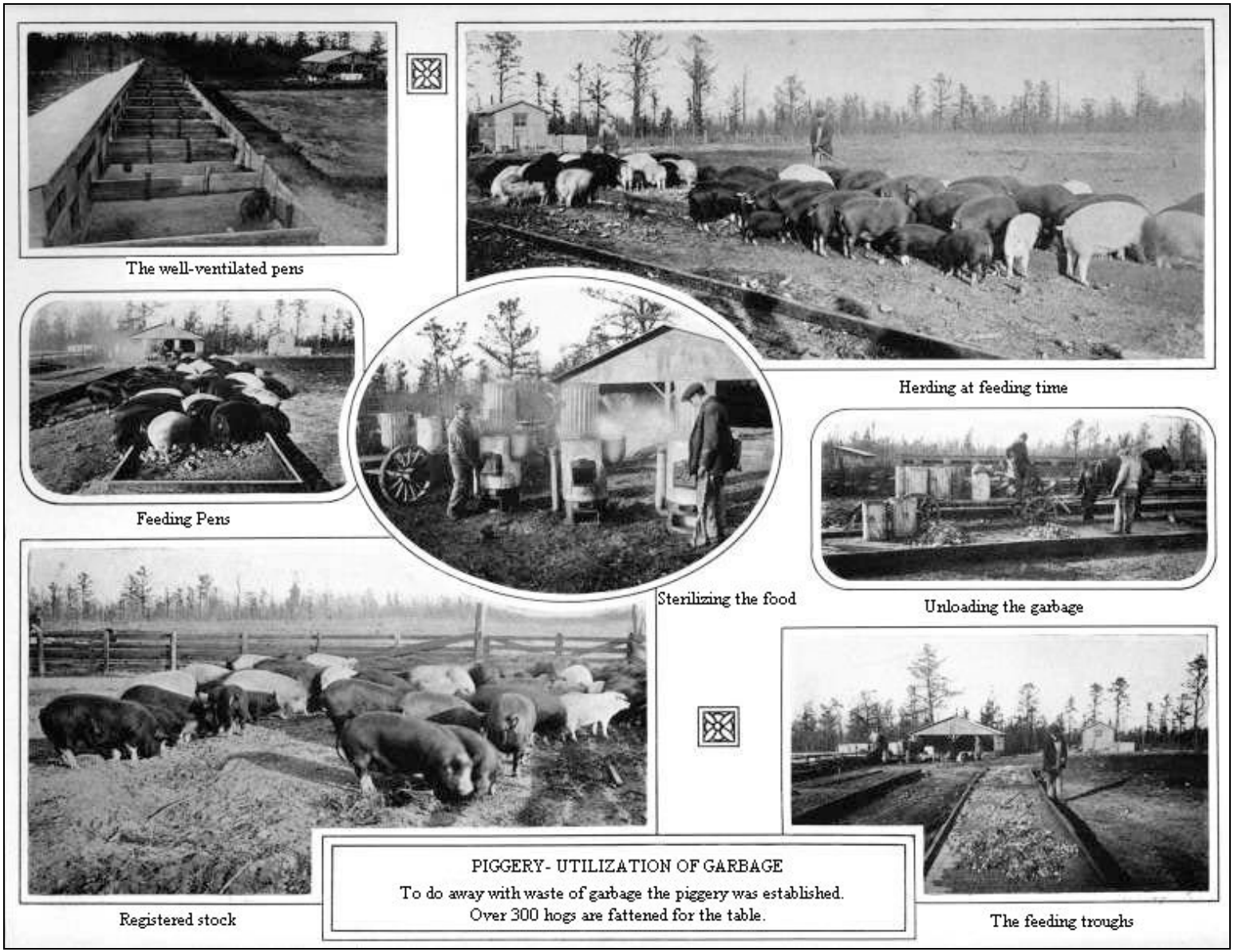

Figure 5. Structures and features at a New Jersey piggery (Hammel 1918:324).

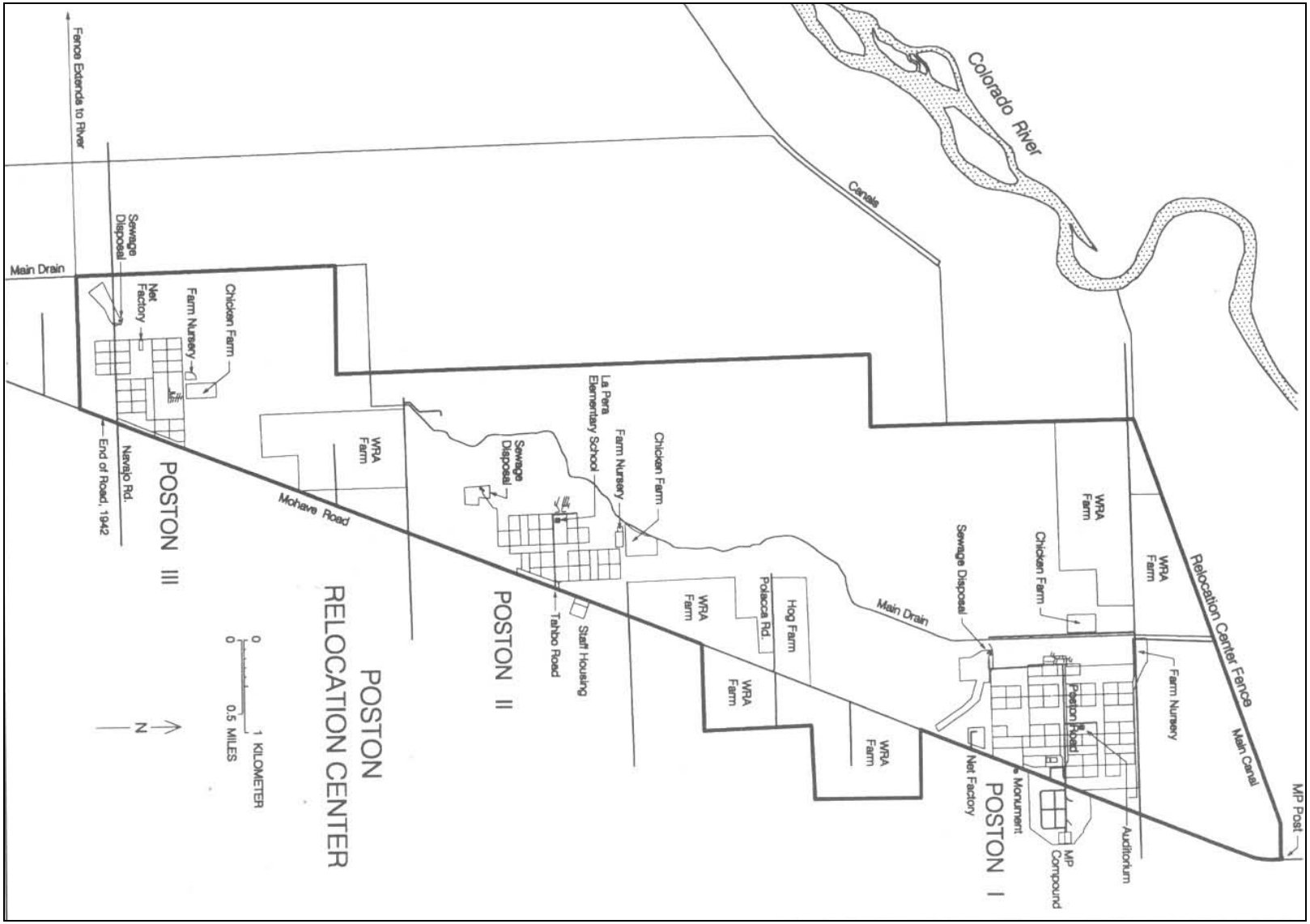

Figure 6. Poston Relocation Center (Burton et al 1999:Figure 10.6).

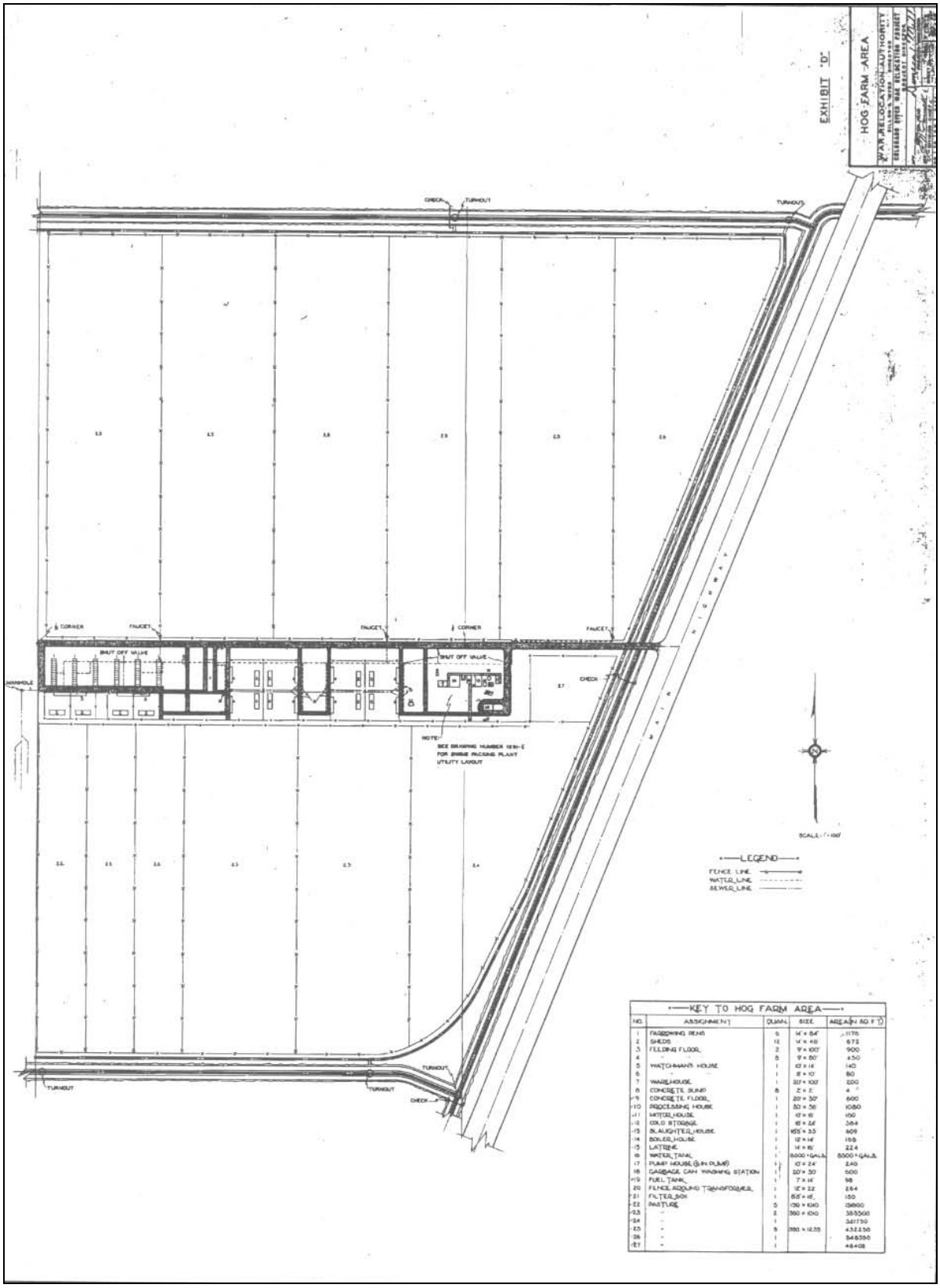

Figure 7. Layout of Poston Relocation Center hog farm (Burton et al. 1999:Figure 10.23).

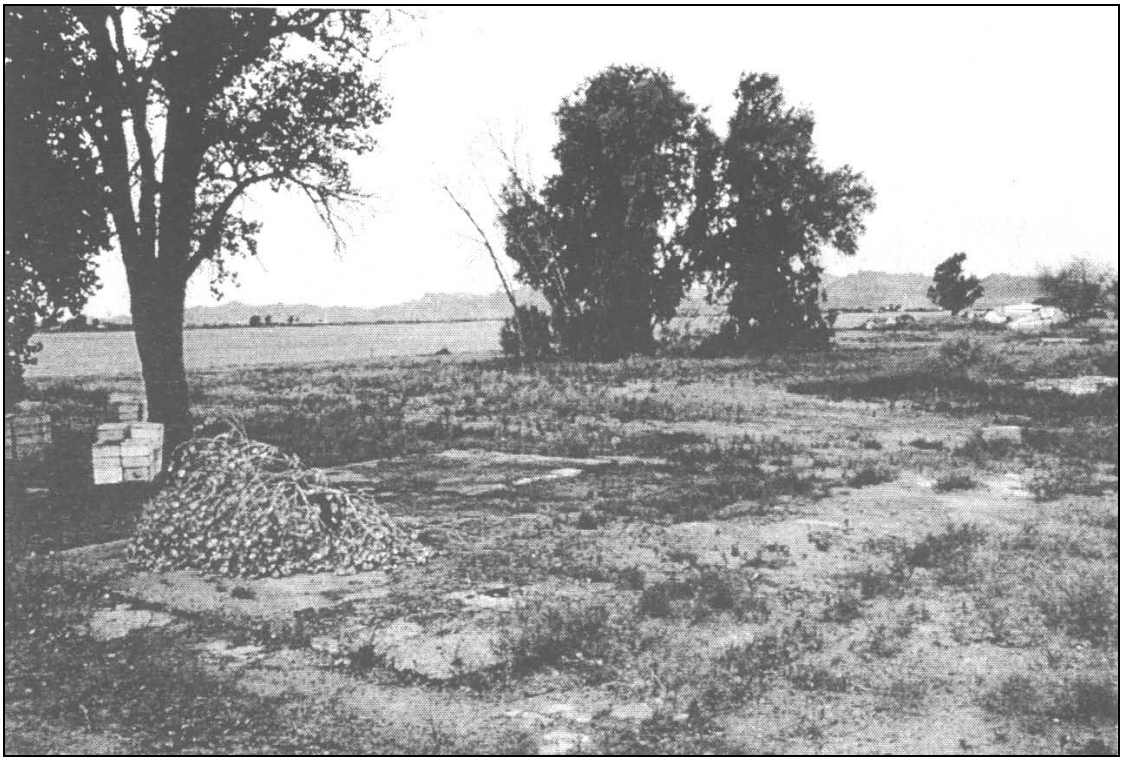

Figure 8. Slabs at Poston Relocation Center hog farm (Burton etal.1999:Figure 10.49).

Figure 9. Slab inscription at Poston hog farm (Burton et al. 1999:Figure 10.50)

DATA GAPS

The most difficult aspect to developing this document was finding documentary information on historical period trash disposal practices during the historical period. When communities record their histories and accomplishments, trash disposal does not appear to be a popular topic. Waste management was left to the lowest possible agent and decisions were not often documented. As a result, there is much that is not known about waste accumulation and disposal.

Finding documentary materials becomes more difficult as time deepens. This is especially true the farther back you go in the historical record. Spanish Colonial period and U. S. military sites are two contexts where it is very probable that disposal of waste was regulated but for which there is minimal archival or archaeological information.

Trash disposal was more of an issue in urban communities resulting in some city and town council records. As towns grew and waste became a civic issue, newspapers and government documents would reference efforts to establish control of waste disposal or document public complaints, but generally lack details about trash disposal practices and the location of dumpsites. In rural areas, waste disposal practices were less documented.

Other gaps in information involve survey and inventory information. A number of the property types identified in this document are not listed or only rarely identified in inventory and survey records. Open dumps, the largest of the pre-environmental disposal sites, are known to have had a variety of ancillary features. There are examples of community incineration facilities, piggeries, scavenger colonies, and sorting operations from various parts of the United States. Archival research for this project identified only a limited number of these types of sites in Arizona.

Incinerators are examples of a once common property type that is not well represented in inventory records. Incinerators were used at community open dumps, municipal and commercial businesses, and in residential settings. Archival records identified references to incinerators associated with large community open dumps in Tucson and Phoenix. Neither of these incinerators currently exists. Only two additional incinerators are listed in SHPO inventories. These are both listed on the National Register of Historic Places as contributing properties to military historic districts.

Waste piles are a property type frequently identified in archaeological surveys, but not easily identified in inventories because of inconsistencies in how they are recorded. Gaps in information about waste management properties could be due not only to terminology and consistency in reporting but also because of a lack of certain property types in Arizona or difficulties with field recognition and identification.

The SHPO Advisory Committee on Historical Archaeology hopes that this guidance document will help to raise the awareness and identification of waste disposal properties in Arizona and promote consistency in the reporting of these properties. The committee welcomes additional information and comments from cultural resource managers and researchers using this document.

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APPENDIX A: DEFINITIONS

Container: Any portable device in which waste is stored.

Disposables: Consumer products, other items, and packages used one or a few times and discarded.

Dump: A site used to dispose of solid waste without environmental controls.

Garbage: Animal and vegetable waste resulting from the handling, storage, sale, preparation, cooking, and serving of foods.

Generator: Any person(s) or facility whose acts or processes produce waste.

Landfill: Disposal sites for nonhazardous solid wastes spread in layers, compacted to the smallest practical volume, and covered by material applied at the end of each operating day.

Litter: The highly visible portion of solid waste discarded outside the regular garbage and trash collection and disposal system.

Open burning: Uncontrolled fires in an open dump.

Open dump: Uncovered site used for disposal of waste without environmental controls.

Rubbish: Solid waste, excluding food waste and ashes, from homes, institutions, and workplaces**.**

Solid waste: Nonliquid, nonsoluble materials ranging from municipal garbage to industrial wastes. Solid wastes also include sewage sludge, agricultural refuse, demolition wastes, and mining residues. Technically, solid waste also refers to liquids and gases in containers.

Storage: The holding of waste for a temporary period.

Transfer point: An area where waste material is bulked for eventual removal, a break/bulk area.

Transfer station: Facility where solid waste is transferred from collection vehicles to larger trucks or rail cars for longer-distance transport.

Trash: Material considered worthless or offensive that is thrown away. Generally defined as dry waste material, but in common usage it is a synonym for garbage, rubbish, or refuse.

Treatment: Methods used to change the physical character of waste.

Waste: 1. Unwanted materials left over from a manufacturing process. 2. Refuse from places of human or animal habitation.

Waste dump: Final depository site for waste.

Waste management: The storage, transfer, and disposal of waste.

Waste pile: A non-containerized accumulation of solid waste.

Waste stream: The total flow of solid waste from homes, businesses, institutions, and manufacturing plants that is recycled, burned, or disposed of in landfills, or segments thereof such as the "residential waste stream" or the "recyclable waste stream.

APPENDIX B:
TIMELINES FOR COMMUNITY TRASH ORDINANCES AND TRASH DISPOSAL

Table 3. Time Line for Town of Casa Grande Trash Ordinances

Date	Ordinance	Comments
1915	Ordinance 6	Provides for abatement of public nuisance.
	Ordinance 11	Prohibits the dumping of rubbish, dirt, etc. on any vacant lots within the inhabited part of town.
	Ordinance 12	Provides for impounding of stray animals.
	Council Actions	Council moved and approved that garbage be removed from town on first Monday of every month.
		Grant Stiles to be paid $3.00 a day for removing garbage.
		Newspaper instructed to publish notice regarding gathering of garbage.
1916	Ordinance 19	Prohibits the stacking of hay in open and outside buildings within fire limits of town.
1918		New ordinance series established.
	Ordinance 8	Establishes fire limits in the city, fire regulations, and penalties for violations.
	Ordinance 11	Requires abatement of public nuisance and penalties for violation.
	Ordinance 16	Requires the impounding of stray animals, rules for care of animals.
	Ordinance 21	Prohibits burning of trash or brush in city, established penalties.
	Ordinance 22	Establishes licensing tax and regulations of dogs in city.
	Ordinance 24	Regulates piling of hay in fire limits of city.
1919	Council Actions	Councilman appointed to hire a wagon or truck to take care of garbage temporarily.
	Council Actions	Matt Geib hired to haul garbage at a salary of $30.00 per month for 1 month.
	Council Actions	Motion to assist health officer in preventing flu epidemic and marshal ordered to carry out instructions from health officer.
	Council Actions	Two councilmen directed to find location of an old well in the road, fill well with trash and cover.
1920	Ordinance 44	Requires all houses in city to provide a metal cannot less than 20 gal. In size for garbage.
	Council Actions	Pay for garbage collector increased to $45.00 per/month, but must also clean up Main Street at least once a week on Friday.
	Council Actions	City engineer directed to run levels for sewage system.
	Ordinance 53	Spitting on sidewalks prohibited.
1921	Council Actions	Tony Tonoa awarded contract at $60.00 per/month for garbage removal.
	Council Actions	Mayor appoints two Councilmen to secure a dumping ground for garbage.
	Ordinance 59	Amendment to allow garbage collector to retain all money collected.
	Council Actions	Garbage site committee reported a possible site, city engineer ordered to run levels and report back.
	Ordinance 57/61	Amendment to have garbage collector hold office at pleasure of the council, owners of office buildings pay for the removal of garbage.
	Council Actions	C. W. Whitney appointed Garbage Collector.
1922	Council Actions	C. W. Whitney retained as garbage collector by renewal of contract.
	Council Actions	C. W. Whitney instructed to fill in ditches where water pipes were installed.

Table 3. Time Line for Town of Casa Grande Trash Ordinances

Date	Ordinance	Comments
1923	Council Actions	Mayor authorized to have rubbish from Clean-up Day removed.
	Council Actions	J. J. Kruse given contract for 25 gal. Garbage can at Auto Park at $4.00.
	Council Actions	City health officer to publish notice that residences & businesses must have metal containers with covers for garbage.
	Council Actions	Health officer instructed to get warrant for arrest of persons not complying with garbage ordinance.
1924	Ordinance 73	Discontinues digging of cesspools and provide for construction of septic tanks.
	Council Actions	Thank Junior Chamber of Commerce for work on "Clean-up Day".
	Council Actions	Joe Healy authorized to remove trash from school grounds.
1926	Ordinance 77	Provides for removal of weeds and refuse.
1927		Whitney elected as garbage collector, and Mr. Harmon appointed to see that garbage was properly removed.
	Council Actions	City purchases land for sewer lines.

Table 4. Time Line for the Town of Clifton Trash Disposal*

Date	Comments
1883-early 1900s	The Arizona Copper Company disposed of unwanted smelter slag directly into the San Francisco River to save costs on hauling. Safford farmers brought a lawsuit against the company to end the practice.
1903	Typhus and malaria outbreaks throughout Clifton influenced propositions by community leaders for sanitation health measures. Two sanitary districts were created-each assigned with maintenance officers to ensure street cleanliness, working toilets, and collecting residential taxes. A health officer was appointed to oversee the two districts.
1909	The City of Clifton was incorporated.
1936-1938	W.P.A. workers paved the streets.
*Information provided by Patton (1977)	

Table 5. Time Line for City of Flagstaff Trash Ordinances

Date	Ordinance	Comments
Pre 1894	Ordinance 1	Requires all filth, garbage, refuse, etc. be removed and kept from premises within town limits and must be removed to a place 1/2 mile from town limits and not less than 200 yards from any roads. Trash may be burned or buried. Marshal is to notify violators who are given twelve hours to comply.
1895	Ordinance 10	Sec. 2.-Prohibits establishment of slaughter houses or soap factories within town limits. Penalties of $300.00 or three months in jail. Sec. 3.- Must maintain privies, vaults, & drains. Sec. 9.- Prohibits depositing of broken glass, filth, waste, or garbage on any public street, highway, grounds, or private premises; except such places designated by street…(?). Marshal shall enforce Ordinance #1.
	Ordinance 12	Sec. 23. - Supervisor of streets in charge of sidewalks, streets, crossings and public places. Sec. 25.- Duty of health officer for ordinances and regulations related to public health.

Table 5. Time Line for City of Flagstaff Trash Ordinances

Date	Ordinance	Comments
1895	Council Action	Directs the clerk to notify the marshal to strictly enforce the ordinances on filth and garbage.
	Ordinance 18	Establishes regulations to prevent the introduction and spread of contagious, loathsome, or infectious diseases in town.
1897-1899	Ordinance 24, 31, 37, 41-48, 53, 55, 58	Provides for issuing of bonds for constructing waterworks system and special election.
1899	Ordinance 62	Creates a board of health and prescribes board duties, powers, and authorities.
1900	Ordinance 71	Establishes Sanitary District No. 1, which abolishes and regulates nuisances therein.
1902	Ordinances 80, 82-83	Election to establish bonds for sewer.
1906	Ordinance 103	Provides for removal and suppression of filth, garbage, and refuse nuisance.
1908	Ordinance 119	Prohibits the roaming of large animals, sheep, goats, and swine in town limits.
1913	Ordinance 147	Prohibits roaming of stock.
1914	Ordinance 164	Directs the disposal of paper and trash on streets.
1916	Ordinance 187	Requires the removal of weeds and other wild growth on lots (amended by Ordinance 239 in 1921)
1917	Ordinance 200	Repeals and amends of Ordinance 103 (repealed by Ordinance 420)
1934	Ordinance 288	Requires licensing of dogs and prohibits roaming (amended by Ordinance 315 in 1937).
	Ordinance 300	Requires cleaning of premises & sidewalks
1937	Ordinance 323	Establishes regulations regarding handling, transporting and storage of liquid petroleum.
	Ordinance 330	Establishes regulations for sanitary plumbing & house drainage.
	Ordinance 333	Relates to collection, removal, and disposal of garbage (amended Ordinance 200).
1946	Ordinance 347	Regulates housing and general sanitation.
1951	Ordinance 376	Repeals portions of Ord. 302 regarding plumbing & drainage.
1952	Ordinance 382	Prohibits digging in streets and alleys.
	Ordinance 389	Establishes regulations for collection, handling, & disposal of garbage.(12-8-52)
1957	Ordinance 420	Amends Ordinance 389 regulating trash disposal.
	Ordinance 426,431	Establishes regulations for installation of sanitary sewer system.
1958	Ordinance 435	Establishes minimum requirements for life, health, and safety.
	Ordinance 446	Amends Ordinance 382 prohibiting digging in streets or alleys.
	Ordinance 447	Promotes health and safety and creates water use and utilization commission.
1959	Ordinance 456	Establishes regulations for plumbing and house drainage.
	Ordinance 470	Prohibits car wrecking and junk yards in business zone.
1960	Ordinance 486	Amends Ordinances 389 and 420 regarding trash collection.(3-22-60)
1965	Ordinance 662	Amends Ordinance 389 for red tag garbage cans. (4-13-65)
1968	Ordinance 739	Prohibits depositing of litter. (12-10-68)
1970	Ordinance 768	Amends Ordinance 347 for cleaning premises. (3-24-70)
1975	Proposed Ord. 944	Repeals Ordinances 389, 420, 486, & 662; adopts solid waste disposal Code. Did not pass.
1981	Ordinance 1162	Rewrites the existing Solid Waste Ordinance (7-7-81)
1982	Ordinance 1203	Establishes a new fee schedule for sanitary landfill. (5-18-82
	Ordinance 1223	Amends solid waste Ordinances 1162 and 1203. Not adopted.

Table 5. Time Line for City of Flagstaff Trash Ordinances

Date	Ordinance	Comments
1986	Ordinance 1454	Adjusts collection fee for residential rubbish can service. (7-1-86)
1987	Ordinance 1490	Adjusts collection fee for residential and commercial refuse. (6-16-87)
1988	Ordinance 1572	Adjusts collection fees for residential and commercial refuse. (7-5-88)
1989	Ordinance 1609	Provides for operation of automated refuse collection system. (2-21-89)
	Ordinance 1621	Revises residential collection, hoist and haul, and landfill fees. (6-6-89)
1990	Ordinance 1662	Revises residential collection, hoist and haul, and landfill fees. (6-5-90)
	Ordinance 1664	Regulates installation and operation of solid fuel burning devices in public places and residences. (6-5-90)
	Proposed Ord. 1670	Amends Ordinance 1664 for solid fuel burning. Not adopted.
	Ordinance 1677	Amends City Code Title 7, Chapter 4, Preventing disposal of solid wastes from outside Coconino County at Cinder Lake Landfill and provides for application of general penalty provisions for Flagstaff City Code. (10-2-90)

Table 6. Time Line for the Town of Florence Trash Ordinances*

Date	Ordinances	Comments
		No council meeting records available before 1920
1958	Ordinance 594	Requires owners, occupants of buildings, structures, or grounds within town limits to provide specified size containers with lids for household trash; unlawful to dump trash on streets or premises in town; corporate entities must maintain outhouses, privies, toilets, sinks, etc. in sanitary condition and must remove rubbish and trash from streets, alleyways, lots, and buildings; establishes penalties for violations and authorizes the marshal to enforce the Ordinance.
1973	Council meeting	Attorney McCarville read abatement order from State Health Director concerning the burning of garbage at dump north of town. (2-1-73)
	Council meeting	Discussion of lack of grant funding for solid waste disposal and landfill garbage disposal on National Guard property. (9-6-73)
	Council meeting	Plans made to take care of the landfill problem for about 50 years with a $10.00 annual lease from the National Guard; requires a fire truck at the site and fencing of about three acres at a time. Mr. Conkle will take care of fill for next years.
1977	Council meeting	Cease and desist order for operation of the landfill for solid waste received by Mayor on 2-28-77; Pinal County Supervisor Karam gave town permission to use county landfill west of Florence as long as necessary; United Materials considering setting up landfill operations off Attawy Road for a fee.
	Ordinance 11	"Garbage and Trash Collection Regulations" document and declaration of emergency, amending Chapter 10 Health & Sanitation of Town Code; establishes penalties, repeals earlier ordinances; establishes fees per unit and collection monthly rather than quarterly; enforcement by health officer. Prohibits burning, dumping, incinerating, and collecting of garbage or rubbish in town without a permit, and depositing on streets, alleys, irrigation canals, or waterways. Establishes town disposal sites (7-7-77).
1979	Council meeting	Council Discusses and votes to charge property owners for annual garbage and trash fees even if service not used.

Table 6. Time Line for the Town of Florence Trash Ordinances*

Date	Ordinances	Comments
1981	Ordinance 31	Amends "Garbage and Trash Collection" to change fees structure.
1985	Ordinance 76	Amends "Garbage and Trash Collection" and declares an emergency. Chapter 10 repealed and replaced by Resolution 229 (12-16-85.
* Information courtesy of staff at the City of Florence.		

Table 7. Time Line for City of Jerome Trash Ordinances

Date	Ordinance	Comments
1899	Ordinance 1	Creates health officer.
	Ordinance 2	Prohibits depositing of filth on streets and sidewalks.
1908	Ordinance 44	Requires receptacles be placed for pickup near street alley.
1925	Ordinance 127	Revises, consolidates and amends sanitation saws; created Office of Sanitation Inspector; Mayor and Council can proclaim "Clean-up Day"; designates frequency of garbage collection.

Table 8. Time Line for Payson-Area Trash Disposal*

Date	Comments
2/28/74	Payson Dump closed. (Payson Roundup)
3/1/74	Star Valley sanitary landfill open. (Payson Roundup)
03/31/74	Ponderosa and Star Valley dumps closed because of federal requirements banning open pit dumps. Pine and Christopher Creek closed and then reopened. (Payson Roundup)
06/13/74	Payson Roundup stated that Strawberry residents were dumping refuse along Fossil Creek instead of at the transfer station in Pine.
06/13/74	Forest Service closed Washington Park Dump. (Payson Roundup)
06/30/74	
7/1/74	Closing date for all open dumps on federal lands. (Payson Roundup)
7/2/74	Pine and Christopher Creek open dumps closed under federal order.
	Transfer station (Pine-Strawberry Transfer Station) in operation at old Pine dump, where trash will be hauled to Star Valley Landfill.
	Gila County making plans for landfill in Pine.
	A transfer station to be placed between Christopher Creek and Kohl's Ranch.
	Landfills went into operation at Gisela, Tonto Basin, and Pinto Creek.
*Information courtesy of Payson Round Up and Pat Stein	

Table 9. Time Line for City of Phoenix Trash Ordinances

Date	Charter/ Ordinances	Comments
1881		Incorporates Phoenix as a municipality.
1881		Prohibits depositing of filth on streets and sidewalks.
1883		Establishes public health officer.
1885	City Charter	Common Council has power to compel owners to keep vacant lots clean; marshal's duties include keeping streets, alleys, lanes & commons clean & unobstructed.

Table 9. Time Line for City of Phoenix Trash Ordinances

Date	Charter/ Ordinances	Comments
1899		
1910	Ordinance 60	Creates Health Department and Board of Health, regulations regarding infectious diseases, and disposal of clothing and bedding of infected persons beyond city limits.
	Ordinance 100 (rev.)	Misdemeanors- prohibits deposal of garbage on streets, alleys, and lots.
	Ordinance 292 (rev. 1899)	Requires placement of refuse in containers in designated areas to be removed by city scavenger.
	Ordinance 99	Chapter III Designates two classes of garbage, specifications for types of containers for each garbage type; removed by city garbage collector.
1951	City Charter Sec. 27 (rev.)	Establishes authority for collection and disposal of solid waste, and duties and powers of public health director. Forbids dumping. Regulates development and operation of facilities; prohibits burning except in an incinerator authorized by city and county; regulates hauling and collection.

Table 10. Time Line for City of Prescott Trash Ordinances

Date	Ordinance	Comments
1883	Ordinance 2	Owner/occupant of premises must remove rock, hay, garbage, etc., at own expense within three days; no depositing of ash in wooden containers.
1925	Ordinance 129	Revises, consolidates and amends sanitation laws; creates Office of Sanitation Inspector; Mayor and Council can proclaim "Clean-up Day"; designates frequency of garbage collection.

Table 11. Time Line for Town of Tombstone Trash Ordinances

Date	Ordinance	Comments
1879		Tombstone incorporates as a village.
1881		Tombstone incorporates as a city.
1881	Ordinance 12	Forbids open sewer ditches.
1882	Ordinance 13	Establishes head of health position.

Table 12. Time Line for City of Tucson Trash Ordinances*

Date	Ordinance	Comments
1872	Ordinance 8	Owners/occupants must keep lot, alley, and street clean. Refuse placed in pits, collected by marshal every Saturday.
1877	Ordinance 1 (rev.)	Vacant lots kept clean; privies purified.
1878	Ordinance 9 (rev.)	Owner keep property & street clean; no dumping on lots; rubbish to be dumped in arroyos and privies purified monthly.
1882	Ordinance 36	Establishment of board of health.
1890		Wing Toy and Ah Sing hog ranch (Arizona Daily Star 1882). Wing Toy and Ah Sing sell hog ranch to Chan Tin Wo (Arizona Weekly Citizen 1882). Chinese swill gatherers (Arizona Weekly Citizen 1884). Ah Been hog ranch (Arizona Weekly Citizen 1890a). Mr. Schmacker,Tucson butcher, purchased 75 hogs from one of the Chinese hog farms (Arizona Weekly Citizen 1890b). Ah Din hog ranch (Arizona Weekly Citizen 1890c) Arrest of slop haulers (Arizona Weekly Citizen 1890d). Sue Kee, former mershant on Congress, now has a hog farm on the Santa Cruz River (Arizona Weekly Citizen 1895).

Table 12. Time Line for City of Tucson Trash Ordinances*

Date	Ordinance	Comments
1908	Ordinance 285	Regulates disposal of bedding, clothing, etc., of people w/infectious diseases.
1909	Ordinance 302	Requires metal trash receptacles with lids.
	Ordinance 303	Prohibits garbage transport between 7:00 am and 12:00 pm.
1910	Ordinance 328	Requires barns and coops to be 20 feet from dwelling; manure removed once a week.
1915	Ordinance 438	Replaces earlier ordinances. Specifies type of garbage containers, prohibits litter in streets, lots, and vacant structures, and using trash as lot fill material. Prohibits salvage of material from city dump.
1926		Call for Bond election to install incinerator & improve city garbage-disposal plant. Repeals and consolidates prior ordinances.
*For detailed information on trash disposal history and timelines for Tucson see Diehl et.al. (1997: Table 2.1)		

Table 13. Time Line for Town of Willcox Trash Ordinances

Date	Ordinance	Comments
1915	Council Action	Supervisor of streets shall see that all dead animals and offensive substances of all kinds and classes are removed from streets and squares.
	Ordinance 4,Sec. 7	Unlawful for person to deposit refuse, garbage, waste paper, or natural debris on streets, alleys, public grounds, or vacant lots, except at time and place provided by regulation; violations a misdemeanor punishable by fine not more than $300 or not more than 60 days in jail or both.
	Ordinance 13	Establishment of board of health.
	Ordinance 13,Sec. 25	Prohibits the gathering, accumulation, storage, exposure or transport of bone refuse, garbage, or other offensive material through the streets or public places without a permit from board of health; no throwing of ash offal, dirt, waste paper, garbage, rubbish, or offensive material in streets, alleys, or public places.
	Ordinance 13,Sec. 26	No person shall allow swill, brine, animal urine, offensive matter, liquid, or other filth to run into or upon the street.
	Ordinance 13,Sec. 27	No person shall allow runoff of vault, privy, cistern, cesspool, or sink onto ground or street.
	Ordinance 13,Sec. 28	No person shall deposit into a vault, sink, privy or cesspool any offal, ashes, meat, fish, or garbage.

Table 14. Time Line for the Town of Yuma Trash Disposal*

Date	Comments
1963	A delegation from Civic Beautification Blue Ribbon Committee urges Yuma City Council to enforce the clean-up ordinance. Mayor Allt stated, "We would like people to respond to the appeal to clean-up the city voluntarily rather than using force to obtain the clean-up" (City of Yuma). Plumbing Code Revisions replaced the 1958 code and will have in it authority for the building inspector to refuse approval of any sewer line installed over a septic tank (City of Yuma).
1968	Chamber Maids Plead: "Surely Somebody in Yuma Has Some Trash for Clean-up": a special clean-up trash campaign. The area that will be visited by the special city refuse trucks to aid in the special clean-up campaign is the center sections of the city bounded by 8th and 16th Streets and East Main Canal and Arizona Avenue (City of Yuma).
1969	War is Declared on Litterat beginning of Johnny Horizon Days. The nine-day campaign begins with about 1,000 Yumans taking to the roads and recreational areas to pick up what others have left behind. The Bureau of Land Management sponsors this event nationally (City of Yuma).

Table 14. Time Line for the Town of Yuma Trash Disposal*

Date	Comments
1970	April 5-$4 Million Plus: New Sewage Treatment Plant will End Dumping in River-The sewage treatment plant being built on the North Figueroa is designed to stop polluting the Colorado River with raw sewage (City of Yuma).
	August 20-Sewage Plant Operating-new sewage treatment plant in 'on stream' for testing (City of Yuma).
	November-Mechanized Trash Run Starts-Prongs on the front of the lift boom of a trash truck slip into carriers on the side of trash bins. Hydraulic controls and lifting mechanisms hoist the six cubic-yard trash bin off the ground. The lifting mechanism trips the trash bin just before the final dump (City of Yuma).
	December-Resident of Area Says Plan 'Stinks' -Armon Curtis lives about two-thirds of a mile from the new sewage treatment plant. Says Curtis, "I don't say it smells bad, I say it stinks." He states that at times, members of his family have been sickened by the smell (City of Yuma)
	December-James Clevenger said the primary source of odor from the plant is from the intake line, the flocculation tank and the primary clarifier. The smell is due to gas known chemically as hydrogen sulfide. It is not toxic, except it might be in high concentration with a lack of oxygen. "Every plant on start-up has operating problems that have to be worked out," Clevenger said. "Modifications are being made by the manufacturer who is paying for the labor and the equipment" (City of Yuma).
1971	City To Open New Landfill. Beginning Sunday, June 6th, the sanitary landfill at 22nd. Avenue. and the Colorado River will be closed. The city will begin using a sanitary landfill south of Highway 95 at County 16th Street and Avenue D on the edge of the mesa (City of Yuma).
1974	Trash Pick Up Studied - The city has concluded its study of trash collection methods. The city has been experimenting with various trash programs to determine ways to save money. Administrator Clevinger said, " We realize we would have people objecting, but we have to go through these traumas sometimes to determine costs" (City of Yuma).
	Neat And Clean. City Sees $$ in New Garbage System - While some angry residents view the proposed new garbage collection system as an inconvenient eyesore, city officials think they're looking at a pot of gold. Available figures from recent surveys indicate that the new Shu-Pak Truck used to collect garbage stuffed plastic bags is substantially cheaper than the old system. Costs may be cut by two-thirds according to an analysis report on the garbage collection (City of Yuma).

* Information courtesy of City of Yuma (2004)

APPENDIX C:
ARIZONA'S MUNICIPAL SOLID WASTE LANDFILLS

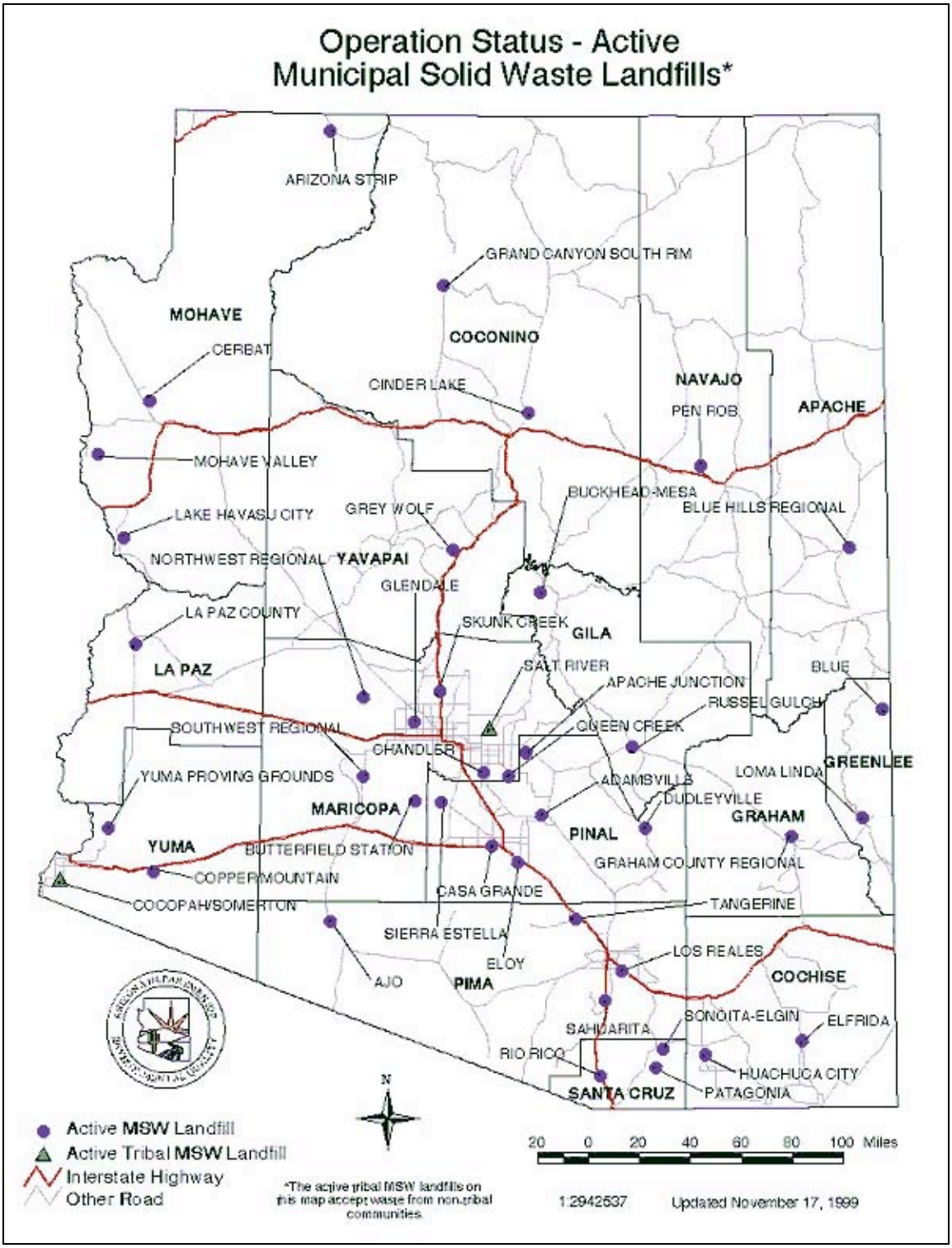

Figure 10. Active Municipal Solid Waste Landfills
Courtesy of Arizona Department of Environmental Quality (2004a)

Arizona's Closed Solid Waste Landfills (Courtesy of ADEQ (2004c))

COUNTY	NAME	OPERATION_	FACILITY_T	LOCATION	OPERATOR_C	OPERATOR_A	OPERATOR_1	OPERATOR_S	OPERATOR_Z	OPERATOR_P	OPERA
Apache	Apache County	Closed	CSWLF	5.2 Miles west of 666 on US 260	Apache County	PO Box 428	St. Johns	Az	85936		
Apache	Chambers	Closed	CSWLF	South of I-40 at Chambers southeast at dirt road .4 miles	Apache County	PO Box 428	St. Johns	Az	85936		
Apache	City of St. Johns	Closed	CSWLF	3.3 miles north of Cleveland St. on 2nd St. west	City of St. Johns	PO Box 455	St. Johns	Az	85936	520-337-2031	
Apache	Concho	Closed	CSWLF	4.3 miles south of Az.180 on AZ. 61, .5 miles	Apache County	PO Box 428	St. Johns	Az	85936		
Apache	Greer	Closed	CSWLF	1 mile of AZ 73 on 373, 1 mile east of Big Bear	Apache County	PO Box 428	St. Johns	Az	85936		
Apache	Navajo	Closed	CSWLF	South of I-40 at Navajo exit cross railroad right	Apache County	PO Box 428	St. Johns	Az	85936		
Apache	Nutrioso	Closed	CSWLF								
Apache	Round Valley	Closed	CSWLF	6 miles south of Eager on US 666	Apache County	PO Box 428	St. Johns	Az	85936	520-337-4364	
Apache	Sanders	Closed	CSWLF	South of I-40 on Az on AZ 61, .2 miles to dirt road .5 miles east	Apache County	PO Box 428	St. Johns	Az	85936		
Apache	Vernon	Closed	CSWLF		Apache County	PO Box 428	St. Johns	Az	85936		
Cochise	Benson Transfer Station	Closed	CSWLF		Benson	980 N. Madison	Benson	Az	85602	602-586-2095	
Cochise	Bisbee	Closed	CSWLF								
Cochise	Bowie	Closed	CSWLF	.8 miles north of Main St. on Central Ave.	Cochise County	Drawer AJ	Bisbee	Az	85603		
Cochise	City of Benson	Closed	CSWLF	.3 miles north of I-10 on Ocotillo Rd.east, .5 mile to site	City of Benson	PO Box 2223	Benson	Az	85602	520-586-2245	
Cochise	City of Douglas	Closed	CSWLF	.3 miles west of Pan American Rd. on 9th street .5 miles	City of Douglas	425 10th St.	Douglas	Az	85607		
Cochise	City of Tombstone	Closed	CSWLF	.2 miles east of US 80 on Middle March Rd.	City of Tombstone	PO BOX 339	Tombstone	Az	85638	520-457-3415	
Cochise	Cochise County	Closed	CSWLF	.6 miles west of 666 on Cochise road, .2 miles north	Cochise County	Drawer AJ	Bisbee	Az	85603		
Cochise	Courtland	Closed	CSWLF	On Courtland Rd.	Cochise County	Drawer AJ	Bisbee	Az	85603		
Cochise	Double Adobe	Closed	CSWLF	1.75 miles of Prince Rd.on west side of Kings Highway	Cochise County	Drawer AJ	Bisbee	Az	85603		
Cochise	Dragoon	Closed	CSWLF	3 miles east of I-10 on Dragoon Rd. ,1.5 miles north of Johnson	Cochise County	Drawer AJ	Bisbee	Az	85603		
Cochise	Ft. Huachuca	Closed	CSWLF	Ft. Huachuca south range of installation	USAG Ft. Huachuca	ATTN:AT25-I5-B	Ft. Huachuca	Az	85613-6000	520-533-3120	5215
Cochise	Naco	Closed	CSWLF	.7 miles north and west of 6th St. on D St.	Cochise County	Drawer AJ	Bisbee	Az	85603		
Cochise	Pearce	Closed	CSWLF	North of US 666 3.2 miles past Sunsites Post Office	Cochise County	Drawer AJ	Bisbee	Az	85603		
Cochise	San Simon	Closed	CSWLF	At San Simon exit I-10 west .75 miles to site	Cochise County	Drawer AJ	Bisbee	Az	85603		
Cochise	Sierra Vista	Closed	CSWLF								
Cochise	Split Rock Ranch Transfer Station	Closed	CSWLF								
Cochise	St. David	Closed	CSWLF	1.5 miles north of US 80 on Sibyl Rd.	Cochise County	Drawer AJ	Bisbee	Az	85603		
Cochise	Sun Sites	Closed	CSWLF	7 miles south of milepost 52 on US 666 east 2 miles	Cochise County	Drawer AJ	Bisbee	Az	85603		
Cochise	Sunizona	Closed	CSWLF	605 miles east of US 66 on AZ 181	Cochise County	Drawer AJ	Bisbee	Az	85603		
Cochise	Sunizona Transfer Station	Closed	CSWLF								
Coconino	Ashurst Lake	Closed	CSWLF	1.1 Mile on road to Ashurst Lake .25 miles north	Coconino County	Highway Department	Flagstaff	Az	86001		
Coconino	B.B Bonner Co.	Closed	CSWLF	Between Industrial Dr. and the Santa Fe Railroad Track	B.B. Bonner Company	PO Box 99	Flagstaff	Az	86001		
Coconino	City of Page (old)	Closed	CSWLF	East on AZ 98 .3 miles from Junction with AZ 98 south .5	City of Page	PO Box HH	Page	Az	86040		
Coconino	Clint's Well	Closed	CSWLF	1 mile west of AZ 486 on west side of road	Coconino County	Highway Department	Flagstaff	Az	86001		
Coconino	Forest Lake	Closed	CSWLF	In Forest Lakes, 2 miles north of AZ 260 Canyon Dr.	Coconino County	Highway Department	Flagstaff	Az	86001		
Coconino	Marble Canyon	Closed	CSWLF	.4 miles southwest of US 89 on road behind	Marble Canyon Lodge	PO Box 2094	Marble Canyon	Az	86036		
Coconino	Morman Lake	Closed	CSWLF	.7 miles west of AZ 486 on Morman Lake	Coconino County	Highway Department	Flagstaff	Az	86001		
Coconino	Mund's Park	Closed	CSWLF	.9 miles west of I-17 on Willard Springs Rd.	Coconino County	Highway Department	Flagstaff	Az	86001		
Coconino	NPS/Lees Ferry	Closed	CSWLF	4 miles west of US 89A on Lees Ferry Rd.	NPS-Glenn Canyon Area	337 N. Navajo Dr.	Page	Az	86040		
Coconino	Ponderosa Paper	Closed	CSWLF								
Coconino	Town of Fredonia	Closed	CSWLF	1.5 miles east US 89A on end of Pratt St.	Town of Fredonia	PO Box 217	Fredonia	Az	86022	520-643-7241	
Coconino	Tusayan	Closed	CSWLF	2.4 miles east of AZ 64 on north side of	Coconino County	Highway Department	Flagstaff	Az	86001		
Coconino	Woody Lake	Closed	CSWLF	1.3 miles south of I-40 on Woody Mountain Rd	City of Flagstaff	120 N. Beaver	Flagstaff	Az	86001		
Gila	BHP/Miami Unit Asbestos	Closed	CSWLF	Hwy 60	BHP Copper, Pinto Valley	PO Box 100	Miami	Az	85539	520-473-6200	
Gila	BSA/Camp Geronimo	Closed	CSWLF	.5 miles southeast of the camp entrance	Boy Scouts of America						
Gila	Christopher Lake	Closed	CSWLF	1.5 miles east of Kohl's Ranch on AZ 260 .5 miles south	Gila County	1400 E. Ash St.	Globe	Az	85501		
Gila	Gisela	Closed	CSWLF	5 miles east of AZ 87 at Gisela	Gila County	1400 E. Ash St.	Globe	Az	85501		
Gila	Payson	Closed	CSWLF	1.6 miles south of AZ 260 on Az 87 .75 east	Gila County	1400 E. Ash St.	Globe	Az	85501		
Gila	Pine	Closed	CSWLF	2 miles south of Pine on AZ 87 .1 mile north of highway	Gila County	1400 E. Ash St.	Globe	Az	85501		
Gila	Roosevelt	Closed	CSWLF	Roosevelt, Az	Solid Waste Dept.	1400 E. Ash St.	Globe	Az	85501	520-425-8501	
Gila	Star Valley	Closed	CSWLF	Tonto National Forest	Solid Waste Dept.	1400 E. Ash St.	Globe	Az	85501	520-425-8501	
Gila	Tonto Basin	Closed	CSWLF	Tonto Basin	Solid Waste Dept.	1400 E. Ash St.	Globe	Az	85501	520-425-8501	
Gila	Town of Hayden	Closed	CSWLF	On Az 177 .3 miles north of mile post 139 .6	Town of Hayden	520 Velasco Ave.	Hayden	Az	85235		
Gila	Town of Hayden #2	Closed	CSWLF	Adjacent to southeast edge of Country Club	Town of Hayden	520 Velasco Ave.	Hayden	Az	85235		
Gila	Town of Miami	Closed	CSWLF	.5 miles west of Miami on US 60 .6 miles south to site	Town of Miami	500 Sullivan St.	Miami	Az	85539	520-473-4403	
Gila	Young	Closed	CSWLF	Tonto National Forest	Solid Waste Dept.	1400 E. Ash St.	Globe	Az	85501	520-425-8501	
Graham	Artesia	Closed	CSWLF	1.2 miles south of Mt. Graham Rd.on US highway 666	Graham County	826 Main St.	Safford	Az	85546	520-428-1962	
Graham	Eden	Closed	CSWLF	1.8 miles east of US 70 on Eden Springsroad	Graham County	826 Main St.	Safford	Az	85546	520-428-1962	
Graham	Ft.Thomas	Closed	CSWLF	1.7 miles south of Ft. Thomas on US 70 west .8 miles to site	Graham County	826 Main St.	Safford	Az	85546	520-428-1962	
Graham	San Jose	Closed	CSWLF	.3 miles north of US 70 at San Jose east .2 miles to site	Graham County	826 Main St.	Safford	Az	85546	520-428-1962	

Graham	Town of Pima	Closed	CSWLF	1.5 miles south of US 70 on Main St. 1 mile west	Town of Pima	110 W. Center	Pima	Az	85543	
Graham	Town of Thatcher	Closed	CSWLF	At Thatcher 1 mile west of US 70	Town of Thatcher	230 College Ave.	Thatcher	Az	85552	
Greenlee	Franklin	Closed	CSWLF	05 miles south of Franklin on US 70 .25 miles	Greenlee County	PO Box 908	Clifton	Az	85533	
Greenlee	Sheldon	Closed	CSWLF	9 miles northwest of Duncan 0.25 miles east of SR 75 at MP 388.5	Greenlee County Board	PO Box 908	Clifton	Az	85533	520-865-4782
Greenlee	South County	Closed	CSWLF	6 miles northwest of Duncan 0.25 miles east of SR75 at MP 385.2	Greenlee County Board	PO Box 908	Clifton	Az	85533	520-865-4782
Greenlee	Town of Duncan	Closed	CSWLF	In Duncan .5 miles west of US 70 on 4th St.	Town of Duncan	PO Box 916	Duncan	Az	85534	
Greenlee	York Valley	Closed	CSWLF	14 miles northwest of Duncan 1 mile east of SR 75 at MP 394.3	Greenlee County Board	PO Box 908	Clifton	Az	85533	520-865-4782
La Paz	Arizona State Parks/Alamo State Par	Closed	CSWLF	With the Alamo State Parks	Az State Parks	800 West Washington #145	Phoenix	Az	85007	
La Paz	Bouse	Closed	CSWLF	Highway 72 to Bouse go 1 mile west on Plomosa turn west	La Paz County	Route Z Box 706 Highway 95	Parker	Az	85344	
La Paz	Cienega Springs	Closed	CSWLF	1 mile east of AZ 95 on Cienega Springs Rd.	Yuma County	2703 Avenue B	Yuma	Az	85364	
La Paz	Ehrenberg	Closed	CSWLF	I-10 west to Ehrenberg exit at Cibola Rd.site 2+ miles	La Paz County	Route Z Box 706 Highway 95	Parker	Az	85344	
La Paz	Quartzsite	Closed	CSWLF	2.5 miles north of I-10 on the west side of AZ 95	La Paz County	PO Box BP	Parker	Az	85344	520-667-3326
La Paz	Salome	Closed	CSWLF	.3 miles north of US 60 on Center St. 2.4 miles	La Paz County	PO Box BP	Parker	Az	85344	
La Paz	Southwest Tire Recycling	Closed	CSWLF	5 miles north of Mc Vay Rd. on highway 72, 1 mile past milepost 40	Southwest Tire Recyclin	PO Box 2217	Poston	Az	85271	520-669-6424
La Paz	Vicksburg	Closed	CSWLF	.4 miles north of Vicksburg Junction then .3 miles west	La Paz County	Route Z Box 706 Highway 95	Parker	Az	85344	
La Paz	Wendan	Closed	CSWLF	1.8 miles east of post office on US 60 1.5 miles out	La Paz County	Route Z Box 706 Highway 95	Parker	Az	85344	
Maricopa	23rd Ave. Landfill	Closed	CSWLF	23rd Ave. and Lower Buckeye	City of Phoenix Public W	3060 S. 27th Ave.	Phoenix	Az	85009	602-534-3333
Maricopa	7Th Street Landfill	Closed	CSWLF	Promiscuous dump at 7th St. and the Salt River						
Maricopa	99TH Ave New River Ranch	Closed	CSWLF							
Maricopa	ASU NO. 1	Closed	CSWLF	Along west side of Scottsdale Rd.south of the Salt River	Az. State University		Tempe	Az	85287	
Maricopa	ASU NO. 2	Closed	CSWLF	Along east side of Scottsdale Rd.south of the Salt River	Az. State University		Tempe	Az	85287	
Maricopa	Aguila	Closed	MSWLF	3.1 miles west of Aquila on the South side of US	Maricopa County	3325 W. Durango	Phoenix	Az	85009	
Maricopa	Allied Concrete	Closed	CSWLF	The southeast corner of Lehi Rd.and Center St.	Allied Concrete	2405 N. Center	Mesa	Az	85201	
Maricopa	Ameron	Closed	CSWLF	West of 12th street south of Watkins in Phoenix	Ameron Pipe Division	PO Box 2050	Phoenix	Az	85036	
Maricopa	Arizona Sand & Rock	Closed	CSWLF	Aqua Fria River and Grand Ave.	Az. Sand and Rock	PO Box 20067	Phhoenix	Az	85036	
Maricopa	Avondale	Closed	CSWLF	North side of Intersection of US 80 and Agua Fria	Maricopa County	3325 W. Durango	Phoenix	Az	85009	
Maricopa	Beardsley	Closed	CSWLF	Between Central Ave. and 7th St south of Beardsley Rd.	City of Phoenix Public W	3060 S. 27th Ave.	Phoenix	Az	85009	602-534-3333
Maricopa	Boothill	Closed	CSWLF							
Maricopa	Buckeye	Closed	CSWLF	At Miller Rd. and Gila River	Town of Buckeye	715 Monroe	Buckeye	Az	85326	
Maricopa	Butterfield/Billing Account For Tempe	Closed	CSWLF		City of Tempe	PO Box 5002	Tempe		85281	
Maricopa	Chandler Int. #1 Interim	Closed	CSWLF	Southeast intersection of Frye and Dobson Rd.						
Maricopa	Chandler Int. #2 Interim	Closed	CSWLF	South side of Queen Creek Rd. 1 mile east of Val Vista Dr.						
Maricopa	Chandler Int. #3 Interim	Closed	CSWLF	Mile north of German Rd. mile east of Gilbert Rd.						
Maricopa	City of Mesa	Closed	CSWLF	Northeast corner of Center St. and Lehi Rd.	City of Mesa	55 N. Center St.	Mesa	Az	85211	
Maricopa	City of Phoenix 19th Ave.	Closed	CSWLF	1 mile south of I-17on east side of 19th Ave.	City of Phoenix	251 W. Washington	Phoenix	Az	85004	
Maricopa	City of Phoenix 22nd Ave.	Closed	CSWLF	22nd Ave. and Lower Buckeye Rd.	City of Phoenix	251 W. Washington	Phoenix	Az	85004	
Maricopa	City of Phoenix 91st Ave.	Closed	CSWLF	West side of 91st. Ave.	City of Phoenix	251 W. Washington	Phoenix	Az	85004	
Maricopa	City of Tempe	Closed	CSWLF	South side of Salt River on Hayden Dr.	City of Tempe	31 E. 5th St.	Tempe	Az	85281	
Maricopa	Deer Valley	Closed	CSWLF	19th Ave. and South of Greenway	City of Phoenix Public W	3060 S. 27th Ave.	Phoenix	Az	85009	602-534-3333
Maricopa	Del Rio	Closed	CSWLF	Between 7th and 16th St. north of Elwood Rd.	City of Phoenix Public W	3060 S. 27th Ave.	Phoenix	Az	85009	602-534-3333
Maricopa	Design Master Homes	Closed	CSWLF	115th Ave .5 miles south on Olive	Design Master Homes	8808 N. 108th Ln.	Peoria	Az	85345	
Maricopa	El Mirage	Closed	CSWLF	South side of Az 93 and Aqua Fria River	Ken Boyce	11141 N. 115th Ave.	El Mirage	Az	85335	
Maricopa	Eskes	Closed	CSWLF	East side of 40th St. south of the Salt River	City of Phoenix	251 W. Washington	Phoenix	Az	85004	
Maricopa	General Motors Proving Grounds	Closed	CSWLF	Elliot Rd. east to Sossman Rd. south to Warner go east	General Motors	13303 S. Ellsworth Rd.	Mesa	Az	85208	602-827-5239
Maricopa	Gila Bend	Closed	CSWLF	3.4 miles north of Az 85 on west side of US 88	Maricopa County	2901 W. Durango	Phoenix	Az	85009	602-506-8726
Maricopa	Goodyear - Sump #1	Closed	CSWLF	1 mile north of Mc Dowall Rd.						
Maricopa	H & H Materials	Closed	CSWLF	West side of Cave Creek Wash north of Tierra Buena	H & H Material	2362 W. Kathleen Rd.	Phoenix	Az	85023	
Maricopa	Hassayampa	Closed	CSWLF	Salome Rd. west to Junction of Wickenburg and Ward Rd.	Maricopa County	2901 W. Durango	Phoenix	Az	85009	602-506-8726
Maricopa	Hickman's Egg Ranch	Closed	CSWLF	.5 miles south of Glendale Ave. on 99th Ave.	Hickman's Egg Ranch	7403 N. 91st Ave.	Glendale	Az	85305	
Maricopa	Juice of Life	Closed	CSWLF	5837 S. 36th St.	Mike Neils	5837 S. 36th St.	Phoenix	Az	85034	
Maricopa	Kachina Ready Mix First Street	Closed	CSWLF	Northeast corner of 1st St. and Clark Dr.	Kachina Ready Mix	1976 E. Pima St.	Tempe	Az	85281	
Maricopa	Laylor materials	Closed	CSWLF	Northeast corner of 16th St. Beardsley	Laylor Materials	PO Box 41662	Phoenix	Az	85080	
Maricopa	Morristown	Closed	CSWLF	1 mile south of US 60 off Morristown overpass	Maricopa County	3325 W. Durango	Phoenix	Az	85009	
Maricopa	New River	Closed	CSWLF	4.3 miles west of I-17 on east Lake Pleasant Rd.	Maricopa County	2901 W. Durango	Phoenix	Az	85009	602-506-8726
Maricopa	Northwest Regional	Closed	CSWLF		Maricopa County					
Maricopa	Old Town Dump	Closed	CSWLF	Dysart Rd. to Rid Canal north of Thomas mile						
Maricopa	Orangewood	Closed	CSWLF	Northeast corner of Orangewood and 107th Ave.						
Maricopa	Perry Lane Methane	Closed	CSWLF	Northeast corner of 1st St. and Perry Lane						
Maricopa	Perryville	Closed	CSWLF	Yuma Rd. east of Luke Air Force Auxilary Field #	Maricopa County	3325 W. Durango St.	Phoenix	Az	85009	
Maricopa	RRCA (old tempe)	Closed	CSWLF	1.3 miles north of Apache Blvd. on Hayden Rd.	Raymond Edwards	1976 Pima St.	Tempe	Az	85281	
Maricopa	Rainbow Enterprises	Closed	CSWLF	.25 miles north of Union Hills Rd. on 54th Dr.	Rainbow Enterprises	19052 N. 54th Ave.	Glendale	Az	85308	
Maricopa	Rainbow Valley	Closed	CSWLF	5.5 miles from AZ 85 west to Airport Rd. south of Arlington	Maricopa County	3325 W. Durango	Phoenix	Az	85009	
Maricopa	Ray Road/Val Vista	Closed	CSWLF							

Maricopa	Reed Construction	Closed	CSWLF	West side of 67th Ave on Salt River	Reed Construction Co.	4637 S. Whitton	Phoenix	Az	85031	
Maricopa	Salt River/Pima Tribe / Tri-City	Closed	CSWLF	1 mile north of Mc Dowell on the Beeline Highway , AZ 87	Salt River Pima Tribe	Route 1 Box 216	Scottsdale	Az	85256	
Maricopa	Satorise (earthworks)	Closed	CSWLF	1.5 miles east of I-17 on end of Greenway Rd.	Pete Satoris	2833 N. River Stage	Phoenix	Az	93640	
Maricopa	Sprecklas Sugar	Closed	CSWLF	The southwest corner of Riggs Rd. and Mc Queen Rd.	Sprecklels Sugar	PO Box 68	Mendola	Ca	93640	
Maricopa	Terra Quest	Closed	CSWLF	1.5 mile south of Baseline east side Priest Ave. Avenidos Del Yaqui	Terra Quest LTD	4541 E. Quartz Mountain	Paradise Valley	Az	85253	602-831-6618
Maricopa	Tolleson	Closed	CSWLF	91st Ave. and Salt River	City of Tolleson	9555 W. Van Buren	Tolleson	Az	85353	
Maricopa	Tri City (old)	Closed	CSWLF	North bank of Salt River west of Country Club Rd.	Salt River Pima Tribe	Route 1 Box 216	Scottsdale	Az	85256	
Maricopa	Tri City/Billing for Gilbert	Closed	CSWLF		Town of Gilbert					
Maricopa	Tri City/Billing for Scottsdale	Closed	CSWLF		City of Scottsdale					
Maricopa	Turf Paradise	Closed	CSWLF	19th Ave. and Bell Rd.	Turf Paradise	19th Ave. & Bell Rd.	Phoenix	Az	85023	
Maricopa	UFI	Closed	CSWLF	Southeast corner of 123rd. Ave. and Bell Rd.	Universal Financial	2930 E. Camelback	Phoenix	Az	85016	
Maricopa	Val Vista	Closed	CSWLF	Southeast corner of Ray Rd. and Val Vista Dr						
Maricopa	Wayne Oxygen	Closed	CSWLF	2615 S. 40th St.	Wayne Oxygen Co.	2615 S. 40th St.	Phoenix	Az	85034	
Maricopa	Wickenburg Billing for Maricopa Cou	Closed	CSWLF		Maricopa Solid Waste D	2901 W. Durango	Phoenix		85009	
Maricopa	William Roer	Closed	CSWLF	75th Ave. north of Southern Ave. on south side of the Salt River	William Roer	Route 1 Box 230	Laveen	Az		
Maricopa	Williams Air Force Base	Closed	CSWLF	Southwest corner of Williams Air Force Base	US Air Force					
Mohave	Antares	Closed	CSWLF	.8 miles north of US 66 on road to Pearce Ferry	Mohave County	119 E. Andy Devine Ave. #C	Kingman	Az	86402	
Mohave	Chloride	Closed	CSWLF	1 mile south of Chloride on 2nd St.	Mohave County	119 E. Andy Devine	Kingman	Az	86402	
Mohave	Colorado City	Closed	CSWLF	.5 miles east of Central Ave. on Mohave Ave.	Colorado City	PO Box 70	Colorado City	Az	86021	520-875-2646
Mohave	Daniel's Wastewater	Closed	NB	Northeast of Bullhead City, 2 miles north of AZ	Daniel's Septic Pumping	PO Box 1483	Bullhead City	Az	86430	520-754-3483
Mohave	Dolan Springs	Closed	CSWLF	5 miles east of US 93 1 mile north	Mohave County	119 E. Andy Devine	Kingman	Az	86402	
Mohave	Hackberry	Closed	CSWLF	.25 miles south of US 66 on road to Wickiup	Mohave County	119 E. Andy Devine	Kingman	Az	86402	
Mohave	Hualapi Mountain Park	Closed	CSWLF	12 miles south of US 66 on Park Rd. 8 miles	Mohave County	119 E. Andy Devine	Kingman	Az	86402	
Mohave	Kingman	Closed	CSWLF	1 mile east of US 66 on Airport Rd.	Mohave County	119 E. Andy Devine	Kingman	Az	86402	
Mohave	Littlefield	Closed	CSWLF	2 miles northeast of Littlefield	Mohave County Public W	3675 E. Devine Ave. #C	Kingman	Az	86401	520-757-0910
Mohave	Meadview	Closed	CSWLF	7 miles south of Meadview on Pierce Ferry	Mohave County	119 E. Andy Devine	Kingman	Az	86402	
Mohave	Oatman	Closed	CSWLF	1 mile south of Oatman	Mohave County	119 E. Andy Devine	Kingman	Az	86402	
Mohave	Peach Springs	Closed	CSWLF	2 miles south of Peach Springs on Reservation	Mohave County	119 E. Andy Devine	Kingman	Az	86402	
Mohave	Sacramento #1	Closed	CSWLF	8.4 miles west of US 93 on AZ 68 .5 miles northwest	Mohave County	119 E. Andy Devine	Kingman	Az	86402	
Mohave	Sacramento #2	Closed	CSWLF	1.3 miles west of US 93 on AZ 68 on Tooman Rd.	Mohave County	119 E. Andy Devine	Kingman	Az	86402	
Mohave	Silver Creek	Closed	CSWLF	Silver Creek Rd. approx. 2 miles west of Bullhead City	Mohave County Public W	3675 E. Andy Devine Ave.	Kingman	Az	86401	520-757-0910
Mohave	Temple Bar	Closed	CSWLF	.7 miles south of ranger station	National Park Service					
Mohave	Topcock	Closed	CSWLF	2 miles north of Topcock on AZ 95	Mohave County	119 E. Andy Devine	Kingman	Az	86402	
Mohave	Transwestern Pipeline	Closed	CSWLF	1 mile north of I-40 35 miles east of Kingman	Transwestern Pipeline C	6381 N. Main St.	Roswell	Nm	88201	
Mohave	Truxton	Closed	CSWLF	1.5 miles southeast of Truxton	Mohave County	119 E. Andy Devine	Kingman	Az	86402	
Mohave	Wikieup	Closed	CSWLF	.5 miles north of Airport on Chicken Springs Rd.	Mohave County	119 E. Andy Devine	Kingman	Az	86402	
Mohave	Willow Beach	Closed	CSWLF	At Willow Beach in Lake Mead National Park	National Park Service	3104 Department of Interior	Washington	Dc	20240	
Mohave	Willow Valley	Closed	CSWLF	18 miles north of Topcock on AZ 95, 4 miles on Willow	Mohave County	119 E. Andy Devine	Kingman	Az	86402	
Mohave	Yucca	Closed	CSWLF	1 mile south of Yucca	Mohave County	119 E. Andy Devine	Kingman	Az	86402	
Navajo	City of Holbrook	Closed	CSWLF		City of Holbrook	PO Box 970	Holbrook	Az	8602	520-524-6225
Navajo	Heber/Overgaard	Closed	CSWLF	2.1 miles east of AZ 260, 1 mile north	Waste Controls of Northern Arizona					
Navajo	Joseph City	Closed	CSWLF	1.5 miles south and east of US 66 on Richards	Navajo County	Governmental Center	Holbrook	Az	86025	
Navajo	Pinetop/Lakeside	Closed	CSWLF	1.1 miles south of Pine Lake Rd. on White Mountain Rd.	Waste Controls of Northern Arizona					
Navajo	Show Low	Closed	CSWLF	3 miles east of Show Low on US 66	City of Show Low	200 W. Cooley	Show Low	Az	85901	
Navajo	Taylor	Closed	CSWLF	2.5 miles south of Taylor on AZ 77 .25 miles east	Town of Taylor	PO Box 249	Taylor	Az	85939	
Navajo	Winslow South	Closed	CSWLF		Town of Winslow	21 Williamson Ave.	Winslow	Az	86407	
Pima	29th St. Landfill	Closed	CSWLF	29th St. (AKA Silverlake Rd.) and Santa Cruz	City of Tucson	PO Box 27210	Tucson	Az	85726	
Pima	A Mountain	Closed	CSWLF	Mission Rd. at base of "A" Mountain	City of Tucson	PO Box 27210	Tucson	Az	85726	
Pima	Broadway #1	Closed	CSWLF	South of Broadway Rd. between Kolb and	Pima County	131 W. Congress	Tucson	Az	85701	
Pima	Broadway #2	Closed	CSWLF	North of Broadway Rd. between Kolb and	Pima County	131 W. Congress	Tucson	Az	85701	
Pima	Cactus	Closed	CSWLF	Alien Rd. between Tucson Blvd. and Cactus Rd.	City of Tucson					
Pima	Catalina	Closed	CSWLF	14425 N. Oracle Rd.	Pima County Solid Was	201 N. Stone Ave. 6th Fl.	Tucson	Az	85701	520-740-6650
Pima	Columbus #1	Closed	CSWLF	North end of Columbus Dr. on east end	City of Tucson	PO Box 27210	Tucson	Az	85726	
Pima	Columbus #2	Closed	CSWLF	North end of Columbus Dr. on east and	City of Tucson	PO Box 27210	Tucson	Az	85726	
Pima	Congress	Closed	CSWLF	East of Nearmont along west side of Santa Cruz						
Pima	Cortaro Road	Closed	CSWLF	South of the Cortaro Road Bridge on east side	Pima County	131 W. Congress	Tucson	Az	85701	
Pima	Cottonwood	Closed	CSWLF	3000 S. Cottonwood Ln.	Barnett & Devoe	701 W. Silverlake Rd.	Tucson	Az	85713	602-623-2662
Pima	Davis Monthan	Closed	CSWLF	Southwest of Davis-Monthan Runway	Davis-Monthan Air Force Base		Tucson	Az		
Pima	El Camino Del Cerro	Closed	CSWLF	.5 miles west of I-10 on El Camino Del Cerro Rd.	Pima County	131 W. Congress	Tucson	Az	85701	
Pima	Esperanza	Closed	CSWLF	South of Tucson on Duval Mine Property	Duval Mining Corp. Z	4715 E. Fort Lowell Rd.	Tucson	Az	85712	
Pima	Granite Construction	Closed	CSWLF							
Pima	Harrison	Closed	MSWLF		City of Tucson	4004 S. Park Ave.	Tucson	Az	85726	520-791-3175
Pima	Harrison Rd. #2	Closed	CSWLF	.5 miles north of Irvington Rd. on Harrison east	Pima County	130 W. Congress Rd.	Tucson	Az	85701	520-791-3175
Pima	Jail Annex (Silverbell)	Closed	CSWLF							
Pima	La Canada	Closed	CSWLF	1 mile south of Helmet Peak Rd.						
Pima	La Cholla #1	Closed	CSWLF	East side of La Cholla Rd. south of Rillito River	Pima County	131 W. Congress Rd.	Tucson	Az	85701	
Pima	Linda Landfill	Closed	CSWLF	North of Alameda and East of Santa Cruz						
Pima	Marana	Closed	CSWLF	1.5 miles west of I-10 on Tangarine Rd south side	Pima County	131 W. Congress Rd.	Tucson	Az	85701	
Pima	Mission Landfill	Closed	CSWLF							
Pima	Nearmont	Closed	CSWLF	Nearmont St. and Melwood						
Pima	Old Nogales	Closed	CSWLF	East of I-19 on Hughes access Rd.	Pima County	131 W. Congress Rd.	Tucson	Az	85701	

Pima	Organ Pipe Monument	Closed	CSWLF	Organ Pipe Monument, 1 mile south of vistors center	National Park Service	3104 Department of Interior	Washington	Dc	20240	
Pima	Pima County	Closed	CSWLF	.25 miles west of freeway north of Grant Rd.	City of Tucson	PO Box 27210	Tucson	Az	85726	
Pima	Pima County - La Cholla #2	Closed	CSWLF	West side of La Cholla Rd. south Rillito River	Pima County	131 W. Congress Rd.	Tucson	Az	85701	
Pima	Rita Road	Closed	CSWLF		Pima County	131 W. Congress Rd.	Tucson	Az	85701	
Pima	Ryan Field	Closed	CSWLF	12 miles west of Tucson on AZ 86 north of 86	Pima County	131 W. Congress Rd.	Tucson	Az	85701	
Pima	Ryland	Closed	CSWLF	West end of 40th St. and Santa Cruz River	City of Tucson	PO Box 27210	Tucson	Az	85726	
Pima	Sahuaro Monument	Closed	CSWLF	1 mile southeast of vistors center	National Park Service	3104 Department of Interior	Washington	Dc	20240	
Pima	Sahurita #1	Closed	CSWLF	.5 miles east of Sahurita	Pima County	131 W. Congress Rd.	Tucson	Az	85701	
Pima	Sasabe	Closed	CSWLF	Presumido Peak Quadrant .5 miles north of US-Mexico						
Pima	Silverbell (old)	Closed	CSWLF	Silverbell Peak covered by mine tailings pag						
Pima	St. Mary's	Closed	CSWLF	The southwest corner of St. Mary's Rd. and	City of Tucson	PO Box 27210	Tucson	Az	85726	
Pima	Tumamoc	Closed	CSWLF	Directly west of Tumamoc Hill on 22nd St.	City of Tucson	PO Box 27210	Tucson	Az	85726	
Pima	Walnut	Closed	CSWLF	North end of Alvernon and Rillito Wash	City of Tucson	PO Box 27210	Tucson	Az	85726	
Pima	Why	Closed	CSWLF	.5 miles north of Why on AZ 85	Pima County	131 W. Congress Rd.	Tucson	Az	85701	
Pima	Wilmot (Tritium)	Closed	CSWLF							
Pima	Wilmot Rd.	Closed	CSWLF	1 mile south of I-10 on Wilmont Rd.	City of Tucson	PO Box 27210	Tuscon	Az	85726	
Pinal	Central Arizona College	Closed	CSWLF	On Signal Peak Campus	Signal Peak Campus	Woodruff at Overfield Rd.	Coolidge	Az	85228	
Pinal	Coolidge #1	Closed	CSWLF	.6 miles north of AZ 287 on Nafiger Rd	City of Coolidge	PO Box 398	Coolidge	Az	85228	
Pinal	Coolidge #2	Closed	CSWLF	1 mile north of AZ 287 on Christenson Rd.	City of Coolidge	PO Box 398	Coolidge	Az	85228	
Pinal	Florence	Closed	CSWLF	On US 80,89 .35 miles south of milepost 138	City of Florence	133 N. Main St.	Florence	Az	85232	
Pinal	Florence State Prison	Closed	CSWLF	.25 miles southeast of Prison	Arizona Department of C	1601 W. Jefferson	Phoenix	Az	85007	
Pinal	Florence State Prison #1	Closed	CSWLF	5.7 miles east of Prison of Division Dam Rd.	Arizona Department of C	1601 W. Jefferson	Phoenix	Az	85007	
Pinal	Kearney	Closed	CSWLF	1 mile west of Kearney on AZ 177	Town of Kearny	PO Box 338	Kearny	Az	85237	
Pinal	Kelvin/Riverside	Closed	CSWLF	1.3 miles south of AZ 177 on Mineral Creek Rd.	Pinal County	PO Box 727	Florence	Az	85232	
Pinal	Maricopa #1	Closed	CSWLF	.8 miles east of Maricopa Rd. on north side of Casa Grande	Pinal County	PO Box 727	Florence	Az	85232	
Pinal	Maricopa #2	Closed	CSWLF	3 miles north of Maricopa on Maricopa Rd.	Pinal County	PO Box 727	Florence	Az	85232	
Pinal	Oracle	Closed	CSWLF	.5 miles east of AZ 77 on northside of Valley	Pinal County	PO Box 727	Florence	Az	85232	
Pinal	Picacho	Closed	CSWLF	0.5 Miles S I-10 on Picacho Blvd. then East to Site on East Shay Rd about 0.5 Miles	Pinal County	PO Box 1747	Florence	Az	85232	520-868-6680
Pinal	Randolph La Palma	Closed	CSWLF	2 miles south of Randolph on AZ 87	Pinal County	PO Box 727	Florence	Az	85232	
Pinal	San Manual	Closed	CSWLF	Mc Nab Parkway through town to dead end Left .4 miles	Magma Copper Co.	PO Box M	San Manual	Az	85631	
Pinal	San Manual Townsite	Closed	CSWLF	McNab Parkway thru town to dead end left .4	BHP Copper Inc. - San M	PO Box M	San Manual	Az	85631	520-385-3489
Pinal	Stanfield	Closed	CSWLF	1.2 Miles W of Maricopa Rd. on Az 84	Pinal County	PO Box 1747	Florence	Az	85232	520-868-6680
Pinal	Superior	Closed	CSWLF	2.1 M. South of US 60 on Mary Dr.	Pinal County	PO Box 1747	Florence	Az	85232	520-868-6680
Pinal	Town of Mammoth	Closed	CSWLF	Off Hwy 77 on N end of town						
Santa Cruz	Kino Springs	Closed	CSWLF	3.5 miles south of AZ 82 on Kino Springs Rd.	Yerba Beuna Utilities	One Xavier Way	Nogales	Az	85621	
Santa Cruz	Nogales	Closed	CSWLF	.5 miles east of US 89 north .5 miles on Bankyard	City of Nogales	1018 Glenn Ave.	Nogales	Az	85621	
Santa Cruz	Tubac	Closed	CSWLF	West from I-19 at exit 40 then .7 miles north to	Santa Cruz County	2150 N. Congress	Nogales	Az	85621	520-761-7800
Yavapai	Ash Fork	Closed	CSWLF	.5 miles north of I-40 on road just west of Dunbar Stone Co.	Yavapai County	255 E. Gurley	Prescott	Az	86301	520-771-3088
Yavapai	Bagdad	Closed	CSWLF	.8 miles east of the high school: Left at mine entrance	Yavapai County	255 E. Gurley	Prescott	Az	86301	520-771-3088
Yavapai	Chemical Nelson Plan Landfill	Closed	CSWLF	Inside the Nelson Plant of Chemical Lime Co. .60 miles	Chemical Lime Compan	7272 E.Indian School Rd. #350	Scottsdale	Az	85251	602-941-1291
Yavapai	Congress	Closed	CSWLF	.1 mile north of mile post 271 on west side of US	Yavapai County	255 E. Gurley	Prescott	Az	86305	
Yavapai	Cottonwood	Closed	CSWLF	3.2 miles west of 89A at end of Mingus Ave.	Yavapai County	255 E. Gurley	Prescott	Az	86305	
Yavapai	Hillside	Closed	CSWLF	North side of AZ 96 at hillside	Yavapai County	255 E. Gurley	Prescott	Az	86305	
Yavapai	Magma Mccabe	Closed	CSWLF	3.5 miles southwest of Humboldt on Iron King Rd.	BHP Copper Inc.	7400 N. Oracle Rd. #200	Tucson	Az	85704	520-575-5600
Yavapai	Mayer	Closed	CSWLF	Turn on Main St. then left behind Black Canyon	Yavapai County	255 E. Gurley	Prescott	Az	86305	
Yavapai	Sedona	Closed	CSWLF	9.6 miles south of Az 179 on US 89A .8 miles west	Yavapai County	255 E. Gurley	Prescott	Az	86305	
Yavapai	Seligman	Closed	CSWLF	.5 miles west of Seligman exit of I-40; 1.1 miles north	Yavapai County	255 E. Gurley	Prescott	Az	86301	520-771-3088
Yavapai	Skull Valley	Closed	CSWLF	1.2 miles north of Skull Valley on AZ 96 .2 miles west	Yavapai County	255 E. Gurley	Prescott	Az	86305	
Yuma	Aztec	Closed	CSWLF	4 miles southeast of I-10 at Aztec Interchange						
Yuma	Dateland	Closed	CSWLF	2.8 miles north of I-18 at exit 67 than 2 miles west	Yuma County	2703 Avenue B	Yuma	Az	85364	
Yuma	Dome	Closed	CSWLF	4 miles north of US on Dome Rd. then east 1 mile	Yuma County	2703 Avenue B	Yuma	Az	85364	
Yuma	Martinez Lake	Closed	CSWLF	1 mile northeast of Fisher's Landing at north end of airstrip	BLM	2400 Valley Bank Center	Phoenix	Az	85073	
Yuma	North Gila Valley	Closed	CSWLF	Ave. and 7 east and County 5th. St. 1 1/4 mile east on County 5th St. across canal	Yuma County	2703 Avenue B	Yuma	Az	85364	
Yuma	Roll	Closed	CSWLF	6 miles north of US 80 on I-8 exit 38 east	Yuma County	2703 Avenue B	Yuma	Az	85364	520-329-2307
Yuma	San Luis	Closed	CSWLF	2.75 miles east of AZ 95 on County and 23rd St.	Yuma County	2703 Avenue B	Yuma	Az	85364	
Yuma	Welton	Closed	CSWLF	2.8 miles north of Welton on Ave.	Yuma County	2703 Avenue B	Yuma	Az	85364	

Instructions for printing the report:

- If you want the Acknowledgments and State Board pages to be single, then print them separately. Starting with the Table of Contents you could print on both sides of the page.
- The last page in the finaltrashdoc is unnumbered; do not include this page in the report. The final page is Page 62 (I couldn't find a way to delete the page without screwing things up)
- The Title page is separate, as is Appendix C Landfills. Print Appendix C on both sides, don't worry about not having page numbers (it's technically page 63-66).
- I also provided a folder of the figures I scanned and experimented with. Some figures are in multiple formats (.bmp, .jpg, .gif). If you need any of these, this folder would be helpful, particularly for printing for overhead use.
- Please go over this again. I took care to edit what needed to be changed (including in the Table of Contents, but may have missed something.